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ORIGINAL ARTICLES.

GLYCERINE ENEMATA AND SUPPOSITORIES IN CONSTIPATION: BASED ON A TRIAL OF THEM IN 234 CASES.[1]

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THE treatment of constipation is often one of the most difficult questions which present themselves to the attention of the physician. Undoubtedly hygienic and dietetic measures, or such internal medication as tends eventually to produce natural, regular, and unaided evacuations, form the measures which are most to be sought after. There are, however, cases in which the movement of the bowels is urgently demanded, and no time for any systematic treatment is allowed; and other instances present themselves where, owing to a congenital or acquired utter intractability of the intestines, a palliative treatment, consisting in the periodical artlficial production of alvine discharges, is the only course left us.

It is in these two classes that the internal administration of laxative medicine and the employment of rectal injections find their proper sphere. Which of them is to be chosen depends, of course, on the exigencies of the case. Very often, certainly, the enema is greatly to be preferred, since it avoids the general disturbance of the gastro-intestinal tract, and the pain and impaired digestion which may ensue. The employment of large injections of water, with or without soap, turpentine, oil, molasses, etc., is frequently both inconvenient and unpleasant; and it was with considerable pleasure, therefore, that I first noticed the recommendation of glycerine by Anacker.

Further research shows, undoubtedly, that the use of glycerine for this purpose was but an old and largely forgotten custom. I have been unable to discover who first devised this treatment, but I have learned that the late Dr. A. H. Smith, of this city, was constantly in the habit of prescribing injections of it; and his former associate, Dr. H. A. Slocum,[2] still uses it with success. Dr. William Pepper[3] has also prescribed it in numerous instances. Eustace Smith[1] refers to the value of the injection of from 40 to 60 drops of glycerine in the constipation of infants, and calls it "an old-fashioned plan lately revived;" and Cadogan-Masterman,[2] while administering a teaspoonful of glycerine, per rectum, to a case of herniotomy, heard the nurse remark: "That was Mr. Warden's favorite plan; he said it was better than all the pills in the world." And this physician, says the writer, died sixteen years ago. Vámossy[3] searched the German text-books with reference to this matter, but only found that Bernatzik[4] stated that glycerine had been used as a laxative and antiseptic clyster; that Daude[5] had given injections of it as a protective and emollient to the mucous membrane of the rectum in dysentery; and that Vogl[6] recommended it for the same purpose in inflammatory diseases of the rectum.

I find the soothing action of glycerine as a local application in dysentery referred to in the *National Dispensatory*, and the drug is also spoken of as a feeble and uncertain laxative; but neither in this work nor in the *United States Dispensatory* is its rectal administration to aid defecation alluded to, and the text-books on *Therapeutics* by Wood, Ringer, Brunton, and Bartholow are silent on the subject. Nevertheless, in Quain's *Dictionary of Medicine*, Oliver, in the article on "Constipation," recommends the injection of a small quantity of glycerine into the rectum.

The history of the present interest in this matter is as follows: A Dutch proprietary medicine, known as "Oidtmann's Purgatif," patented by Dr. Oidtmann, of Maastricht, had attained surprising repute in Holland and Germany for the treatment of constipation. A small metal syringe, holding about 3 to 5 grammes, accompanied the bottle, which contained a grayish-black, slightly greenish fluid, thicker than water, feeling somewhat oily, and having a strong and peculiar odor, which has been compared to that of mouse urine. What was claimed for the preparation it undoubtedly performed; namely, that when about one-half a teaspoonful of it was introduced into the rectum, there was produced a prompt, easy, complete, and painless evacuation.

[1] Read before the Philadelphia County Medical Society, November 28, 1888.

[2] Personal communication.

[3] Personal communication.

[1] Brit. Med. Journ., vol. ii. p. 7, 1888.

[2] Brit. Med. Journ., vol. i. p. 132, 1888.

[3] Wien. med. Presse, No. 48, p. 1641, 1887; Therap. Monatsh., March, 1888.

[4] Arzneiverordnungslehre, vol. ii. p. 196.

[5] Husemann: Arzneimittellehre, vol. i. p. 358, 1874.

[6] Bernatzik-Vogl: Arzneimittellehre, p. 97.

There was no tenesmus, but a slight sense of irritation of the anus remained for about a quarter of an hour after the movement.

How great a renown the "Purgatif" was obtaining was shown by its widespread employment by the laity, and by the fact that even some physicians were prescribing it, while more than one chemical examination of it was made. Analyses by Birnbaum,[1] Mylius,[2] Rupp,[3] Steensma,[4] Anacker,[5] Guldensteenden-Egeling,[6] and that made by the authority of the *Land-Medicinal-Collegium*[7] of Saxony, were published; the researches of Guldensteenden-Egeling being particularly careful and exhaustive. Though these differ considerably as regards the nature of the other ingredients, all but that of Mylius agree in declaring glycerine to be the main constituent. This writer simply confesses his inability to discover of what the medicine is composed.

Whether glycerine was also the *active* ingredient could only be determined by clinical experiment, and Anacker,[8] after a series of trials, found that it was, and that 1½ to 2 grammes of it, introduced into the rectum, acted as quickly and thoroughly as did the "Purgatif." He believes that in this method of employing glycerine we have a valuable addition to our armamentarium, applicable to all cases of constipation except those in which there is ulceration of the rectum. The action of glycerine he considers due to its hygroscopic qualities. By abstracting water from the mucous membrane it produces a hyperæmia of the lower parts of the bowel, and, through the consequent excitation of the nerves, an increased peristaltic action.

A little later than Anacker's paper, and without reference to Oidtmann's Purgatif, a publication of Unger's[9] recommended the employment of glycerine in the form of suppositories with soap and *Rhamnus frangula;* and stated that physicians had given them, as thus prepared by him, with very satisfactory results. In an article[10] appearing nearly a year later he changes the formula considerably, while increasing the glycerine and diminishing the soap, as he says that there is no doubt the former is the active agent. He believes that the glycerine excites the mucous glands to greater secretion, and repudiates the theory of increased reflex peristalsis, as suggested by Anacker.

[1] Pharm. Centralhalle, No. 22, p. 275, 1887.
[2] Ibid., No. 6, p. 73, No. 23, p. 285, 1887.
[3] Ibid., No. 22, p. 275, 1887.
[4] het Maandblad voor Apothekers, April, 1887; Pharm. Centralhalle, No. 28, p. 823, 1887.
[5] Deutsch. med. Wochenschr., No. 37, p. 823, 1887.
[6] het Maandblad voor Apothekers, June, 1887; Pharm. Centralhalle, No. 28, p. 341, 1887.
[7] Münch. med Wochenschr., No. 49, p. 990, 1887; No. 9, p. 146, 1888.
[8] Deutsch. med. Wochenschr., No. 37, p. 823, 1887.
[9] Pharm. Centralhalle, No. 42, p. 529, 1887.
[10] Pharm. Centralhalle, No. 16, p. 196, 1888.

Vámossy[1] was induced by the communication of Anacker to administer enemata of glycerine to 150 cases of the most different diseases, varying in age from six to seventy years, all of whom had been constipated for at least two days. A small syringe made for the purpose was employed, and 2 c.cm. (equivalent to 2.5 grammes) of glycerine injected. Evacuation of the bowels followed after one to two minutes as a rule, and the stools were always soft and formed; no case of a fluid stool being witnessed. Only in rare instances, as in obstinate habitual constipation or where cerebral hemorrhage had occurred, was the evacuation delayed for one-half hour. Defecation was painless, and no uncomfortable sensation remained afterward. It was noticed that the greater the fecal mass in the intestine the more energetic and complete the action of the enema seem to be. The author agrees with Anacker as to the *modus operandi* of glycerine in the rectum. Should pain or burning in the rectum be produced by a too powerful action of the glycerine—as he has heard has occurred in delicate individuals in private practice—he advises that the drug be diluted with one-half its volume of water.

Seifert,[2] though bitterly opposed to patented medicines, had Oidtmann's Purgatif so constantly forced on his attention, that he tested its power, and found that it fully met the claims made for it. Having heard of Anacker's discovery of the active constituent, he tried glycerine enemata in 26 cases, besides children, and found that 3.5 c.cm at once produced a copious evacuation, without leaving any disagreeable sensation. In no case did he see the drug lose its effect, though sometimes given regularly for many months.

Boas[3] has likewise used this treatment in a long series of cases with good results. In patients with hemorrhoids, however, the insertion of any syringe may be productive of pain. At the best the use of a syringe is not altogether pleasant, is difficult for the patient himself to employ, and cannot always be prescribed in private practice. The author has accordingly devised another form of administration, and has in 20 cases employed hollow suppositories of cacao-butter, each containing 1 gramme of pure glycerine, this dose being found sufficiently large, and acting in fifteen to twenty minutes. He never found it necessary to use more than one suppository, though there would be no objection to giving two.

Kröll[4] also favors the employment of cacao-butter suppositories containing, at least, 2 grammes of glycerine. The evacuation takes place in five to fifteen

[1] Wien. med. Presse, No. 48, p. 1641, 1887; Therap. Monatsh., No. 40, 1888.
[2] Münch. med. Wochenschr., No. 9, p. 146, 1888.
[3] Deutsch. med. Wochenschr., No. 23, p. 469, 1888.
[4] Therap. Monatshefte, p. 506, November, 1888.

minutes. He has used them in 50 cases, and with only 1 failure. While he has often seen glycerine injections produce an unpleasant sensation in the rectum, he has never known the suppositories to have this effect. He considers glycerine especially adapted to cases of constipation from insufficient peristalsis of the large intestine, caused by congestion of the portal system, or occurring in those leading sedentary lives or confined to bed. The treatment does not lose its effect by repetition.

Gerstacker[1] took careful notice of 55 cases in which he employed enemata of about 2 grammes of glycerine. The results were very satisfactory, defecation taking place shortly after the injection. The average time required was eight and one-half minutes, the shortest two minutes, and the longest six hours. Usually there was but one stool, and this soft; eleven times it was hard, and four times there were repeated evacuations. In no instance was there any unpleasant sensation after the evacuation. The author uses a small metal or glass syringe, to which he attaches a piece of rubber drainage tube one-half metre long. This device, he thinks, removes the objections raised by Boas, since the patient can very conveniently and without assistance give himself the injection while lying on the back.

Schindelka[2] has had very favorable results with glycerine enemata in 100 horses, 5 grammes always producing an evacuation.

While believing that suppositories have a decided advantage over enemata, Dietrich[3] considers those recommended by Boas to have the disadvantages of being too large, and of inserting into the rectum too great a proportion of comparatively inert matter. He therefore describes and offers for sale a suppository composed of ninety parts of glycerine and ten parts of a hard stearine soap; and says that according to the report from various physicians who have tried them in numerous cases, they produce a natural, easy, and prompt action, the bowels being opened within ten minutes.

Novotny[4] has administered enemata of ½ to 1 fluidrachm of glycerine to 200 patients with the most diverse diseases, and in all but three or four a good stool was produced within a few minutes, though in a few cases two to three hours elapsed. There was not a disagreeable symptom in a single instance. In about a third of the cases a second liquid stool followed the first formed one. He has had cases of obstinate constipation yield almost immediately to this treatment, after having withstood the most powerful purgatives.

[1] Therap. Monatshefte, p. 425, September, 1888.
[2] Pharm. Centralhalle, No. 16, p. 196, 1888.
[3] Pharm. Centralhalle, No. 37, p. 445, 1888; Apotheker Zeitung, No. 71, 1888; Pharm. Zeit., No. 71, 1888.
[4] Gyógyászat. Quoted in Lancet, i. 944, 1888.

Subbotić,[1] after numerous trials of glycerine by enema, confirms the favorable opinion of others. It was always promptly efficient if the rectum contained feces. When, on the other hand, the rectum was empty, repeated injections failed to induce a passage. He considers that this is entirely in accord with Anacker's explanation, and is a proof that the action of glycerine is confined to the lowest section of the bowel, and that it is unable to stimulate the upper portions to propel the feces downward.

Reisinger[2] reports his experience with 115 rectal injections of glycerine, 101 of which were successful, usually in two to fifteen minutes, though the evacuation was sometimes delayed for one to two hours. The cases were of the most different diseases. The stools varied from the consistence of diarrhœa to quite decided solidity. The only unpleasant secondary effects noted were the complaints of slight burning in the anus in two cases. Post-mortem examinations were later made on five of the cases, but in every instance the mucous membrane of the rectum was found to be destitute of any change which could have been produced by the injections. As regards the manner in which glycerine provokes the evacuations, it is evident it is not through a mechanical irritation, since the injection of an indifferent chemical substance (solution of albumen) had no effect at all. Neither does the author share the views of Anacker, since he found that concentrated solutions of sulphate of sodium introduced into the rectum had no such effect as the glycerine has, though they have the power of abstracting water. It is more probable, therefore, that there exists a direct chemical action of the glycerine on the mucous membrane of the rectum.

Ullmann[3] has made a careful, critical study of the effect of glycerine enemata, and the relation of the successful administrations to the disease, the habits of the patients, etc. In the great majority of 174 cases the stools were hard, and in only seven were they watery. Subsequent constipation was seen in about one-third of the patients. Diarrhœa followed in six patients, all of them suffering from tuberculosis. A slight burning in the anus was not infrequent after defecation, but pain of any moment only occurred in five patients. Like Subbotić, he noted the almost invariable failure of the glycerine in cases in which the rectum was empty, and the feces were contained in the bowel above it; and with him believes that the inverse of peristalsis is limited to the lower section of the large intestine. He agrees with Unger that the evacuation is due to a profuse hypersecretion produced by the glycerine. He recommends the injections when it is desired to

[1] Centralblatt f. Gynäk., No. 27, 1888.
[2] Prager med. Wochenschr., 209, May 30, 1888.
[3] Centralbl. f. d. gesammt. Therap., Aug. 1888.

empty the rectum quickly, or when general peristalsis is to be avoided. Their habitual use is improper, as there may be danger of causing inflammation. The amount used was 3 to 6 grammes, and the evacuation generally followed in three to fifteen minutes.

From England comes the report of a trial of glycerine by J. Althaus,[1] who announces his success with it in a large number of his own cases, while several other physicians have told him of their satisfaction with the plan of treatment. The evacuation of the bowels takes place almost immediately, or within a few minutes, and there is no pain or discomfort, unless it be a little throbbing felt in the rectum for a few moments afterward. M. Prowse[2] states that glycerine is quite effectual when diluted with an equal quantity of water. W. Easby[3] cannot speak too highly of it as a laxative enema, having used it frequently of late, though his first trial of it was about two years ago. He gives one fluidrachm with a little water in a syringe holding about half an ounce. C. J. R. McClean[4] has employed it by enema in a number of cases with very satisfactory results; using a common glass urethral syringe. J. Bunting[5] does not find glycerine diluted with water act nearly so well as when pure. C. Palmer[6] administers it with a syringe in the shape of a small India-rubber ball with a vulcanite nozzle. W. B. Roué[6] describes, with an illustration, a small graduated glass syringe holding 3 drachms, and adapted for glycerine enemata. The vulcanite nozzle is two inches long, and of sufficiently large bore to admit the easy entrance and exit of the glycerine. G. A. Carpenter[7] tabulates the results of 214 injections of 1 to 2 drachms of glycerine in 63 children of from one to eleven years of age. The method was uniformly successful, and in no case did it invariably fail. The enemata are easy of application, prompt in action, and unattended by the slightest discomfort. He considers them superior to the drugs ordinarily employed for constipation.

An American report on the rectal use of glycerine as a laxative is that of E. R. Mayer,[8] who has employed enemata of ½ drachm with very general success, and has also used the drug in hollow suppositories of cacao-butter, or enclosed in gelatine capsules. A slight degree of rectal irritation followed the repeated use of the capsules. In a case of painful hemorrhoids enemata of glycerine not only emptied the bowels more thoroughly than compound licorice powder had done, but appeared to give more relief to the pain than all the local treatment previously employed. The author then reports an interesting case of extreme tympanites in peritonitis unrelieved by injections of soap, water, and turpentine, in which 2 fluidounces of glycerine introduced high into the rectum gave great relief by the discharge of a large amount of flatus within twenty minutes, followed later by a fecal evacuation. Contrary to the views of Subbotic, he believes that glycerine has a local action not only on the lower bowel, but that by its peculiar power of diffusing itself it rapidly spreads past the sigmoid flexure to some of the coils of the small intestine. In this way a large amount of fluid is mingled with the feces, and finally a general peristalsis is produced.

I. N. Love,[1] also, has used glycerine enemata in many cases, and with uniformly satisfactory results; finding it particularly useful in infants and mothers in whom a constipated habit has persisted after the birth of the child. By giving the injection at the same hour every day the unaided regularity of the bowels may be brought about. In a few cases of hemorrhoids and of severe rectal irritation he had better results with glycerine than with the purgatives and sedative ointments previously used.

The marked success met with in the first few cases in which I used this treatment was reported in a brief note[2] published last spring. Since that time the results have continued to be so good, that glycerine enemata or suppositories have largely supplanted other aperient rectal medication in the medical wards under my charge, as well as in other wards of the University Hospital. The collection and preservation of records of cases have been tedious and troublesome, and I am largely indebted in this report to the patient care of Drs. Leidy, Kirby, Wood, and Hay, of the resident medical staff. Up to the time when enumeration had been discontinued there had been 234 cases of constipation, occurring in the most varied medical and surgical diseases, to whom over 530 rectal administrations of glycerine had been given. When enemata were employed the amount used was usually 1 to 2 fluidrachms, though 1 fluidrachm was generally found sufficient. This was sometimes injected pure, sometimes mixed with a small quantity of water; the effect being much the same in either case. In some instances 20 minims (25 grains) of glycerine were enclosed in a gelatine capsule, and inserted into the rectum, and answered well in many cases. A solid suppository, made by incorporating glycerine with paraffine, was devised by Dr. Leidy, and gave satisfaction in some instances, but required to be kept from moisture, and in a cold place. By far the greatest success with suppositories, however, was obtained with those

[1] Brit. Med. Journ., Dec. 24, 1887.
[2] Brit. Med. Journ., i. 449, 1888.
[3] Ibid.
[4] Ibid.
[5] Brit. Med. Journ., i. 569, 1888.
[6] Ibid.
[7] Brit. Med. Journ., i. 1281, 1888.
[8] Lancet, vol. ii. 905, 1888.
[9] MED. NEWS, i. 200, 1888.

[1] Journ. Amer. Med. Assoc., April 14, 1888.
[2] Annual Univ. Med. Sciences, iv. 1887. Article, "Glycerine."

made with glycerine and soap, which I will presently describe.

The results of the glycerine treatment were most encouraging, as there nearly always followed a full, easy, and painless movement within a few minutes after its employment. The average time required after the enemata was probably five to ten minutes, though the effect was sometimes not evident for fifteen to thirty minutes, and in one case was delayed one and a half hours. Very frequently the evacuation was almost immediate. In a case of convalescent typhoid fever, for example, whose constipation, lasting three and a half days, had not been relieved by an injection of warm water, an enema of 1 drachm of glycerine produced such an immediate effect that the nurse had hardly turned away from the bed before the patient called for the bed-pan. The thought naturally arises that such prompt results must certainly be due to a strongly irritating action on the mucous membrane of the intestine. I would, however, call particular attention to the fact that this does not appear to be the case. My experience agrees with that of the writers already quoted, that it is rare that pain in the abdomen or rectum, or other symptom of real irritation precedes the evacuation or remains after it, as is so often the case after stimulating aqueous enemata have been used. In a few cases I have recorded a stinging in the rectum attending the injection, or a burning sensation, lasting a few minutes after the bowels were opened. It was found that this did not occur if the glycerine was mixed with a small quantity of water. In a few other instances there was actual rectal pain, due not so much to the action of the glycerine as to the passage of not sufficiently softened feces.

All that has been said regarding enemata of glycerine applies as well to the effects of suppositories, except that the latter require somewhat longer to operate, owing to the time needed for their solution in the bowel. They are also somewhat less certain in their action, on account of the medicament contained in them. Glycerine usually produces but one stool, and this is soft rather than liquid. It is for this reason that the remedy sometimes fails in obstinate constipation, the very hard scybalous masses not being softened enough. Yet, I am by no means certain that, even in most cases of this kind, soap and water have, as a rule, any superiority, for both the enemata and suppositories of glycerine were often found useful in the enforced constipation following gynecological operations, such as perineorrhaphy, where it was desired that the feces should be soft, and that straining be avoided. There were instances, too, and that not infrequently, in which glycerine produced an easy passage, but in which soap and water either effected no movement at all, or did not soften the scybala sufficiently to prevent painful evacuations. This method of treatment was found particularly valuable in cases in which opium in large doses had been administered during a considerable period. It failed in no such instance, though turpentine with soap and water was often ineffectual. I cannot speak from experience as regards the contra-indication to the use of glycerine in ulceration of the rectum, to which Anacker alludes. The local employment of it in dysentery, already referred to, would indicate that it is not necessarily to be avoided as a laxative when an ulcer exists. I have never seen the drug lose its effect after continued use, and have not found it necessary to increase the dose, nor does there seem to be any tendency to constipation remaining after the treatment is discontinued.

Glycerine is not, of course, an infallible remedy, and, like all other aperients, will sometimes fail utterly, even in cases in which it has been at other times effectual. My experience with it has, however, been sufficiently extended to justify the conclusion that in it we have a safe, prompt, and reliable means of obtaining an evacuation of the bowels; more convenient of employment, and more pleasant to the patient than are large aqueous injections, and certainly superior to them as regards the absence of irritation of the rectum.

Finally, I would again call attention to the administration of the drug in the glycerine and soap suppositories referred to, as an elegant means of exhibiting the remedy in private practice. I have made a somewhat extended trial of these, modelled after those manufactured by Dietrich. Messrs. Henry C. Blair's Sons, apothecaries, of this city, have taken great trouble in perfecting the method of their preparation, and now offer them for sale. 50, 66, and 75 per cent. of glycerine, with soap, was not found reliable. Finally, by using an especially hard castile soap 90 per cent. of glycerine was incorporated in suppositories weighing 52 grains each, and these were efficient in the majority of cases. It is to be remembered that the total amount of glycerine in each (46 grains) is not quite two-thirds of that generally used for an enema (viz., 1 fluidrachm, 75 grains). If, therefore, a case does not easily yield to one of them, there would be no objection to giving two at a time. These suppositories are made after the shape recommended by Dr. Dixon,[1] and have accordingly all the advantages peculiar to this form. They are very hygroscopic, but when wrapped separately in tin-foil keep very well, and I can imagine no more elegant method of producing an intestinal evacuation than by their use. Very neat little suppositories for babies, holding 10 or more grains, are also supplied. Mr. James J. Ottinger, apothecary, of this city, has sent me samples of 90 per cent. glycerine supposi-

[1] Therap. Gaz., April, 1888.

tories made with a dry stearine soap, and now offered for sale. He has succeeded in preparing them in such a way that the covering of tin-foil is dispensed with. They are not very hygroscopic, even on exposure to air for some weeks, and present a handsome appearance. I have not myself had any experience with them. Messrs. Parke, Davis & Co. also manufacture 90 per cent. soap suppositories, samples of which they have sent me. I have not yet had the opportunity of trying them.

Though glycerine suppositories are somewhat less certain than are the enemata, yet they are not only much more convenient for private practice, but, owing to their rather slower action, I found them entirely unproductive of discomfort, even in the occasional instances in which the enemata have caused slight burning. The largest rectal gelatine capsules hold not more than 25 grains; an amount too small to be generally useful. Their action is uncertain, and even when two are given at a time, a movement does not occur for thirty to forty minutes. Another objection is that, if sold already filled, they rapidly soften and allow the glycerine to escape. The hollow cacao-butter suppositories are not to be recommended on account of the size required to hold a sufficient quantity of glycerine, and the large amount of inert matter employed. I cannot, therefore, but consider those made with soap the most eligible form.

123 SOUTH EIGHTEENTH ST., PHILA.
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IS THE ELECTRIC LIGHT INJURIOUS TO THE EYES?

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BEFORE proceeding to the direct answer of the question, it may be well to glance at the larger one that refers to the relation of the electric light to general hygiene.[1] Most every one has a general impression that the electric light is much superior to other methods of artificial illumination, so far as concerns our general health and comfort, but few could give a reason for the faith that is in them. They will come out of a theatre, music hall, church, etc., with headaches, lassitude, exhaustion, their bodies bathed in sweat, all resulting in colds, and a multitude of major and minor affections, and never utter a word of protest or complaint against the culpable and parsimonious management that permits the vitiation, poisoning, and superheating of the atmosphere by a thousand gas-jets. It is certainly not too much to urge, as has been done (14), that the matter should be under the control of the law, and that electric lighting is of political importance on a par with the supply of pure water and drainage. The following figures, from a trustworthy source (14), are so eloquent that they need no comment or explanation:

TABLE.

Burnt to give light of 12 candles equal to 120 grains per hour.	Cubic feet of oxygen consumed.	Cubic feet of air consumed.	Cubic feet of CO_2 produced.	Cubic feet of air vitiated.	Heat produced in 100 lbs. water raised 10° F.
Cannel gas,	3.30	16.50	2.01	217.50	195.0
Common gas.	5.45	17.25	3.21	348.25	278.6
Sperm oil,	4.75	23.75	3.33	356.75	233.5
Benzole,	4.46	22.30	3.54	376.30	232.6
Paraffin,	6.81	34.05	4.50	484.05	361.9
Camphine,	6.65	33 25	4.77	510.25	325.1
Sperm candles,	7.57	37.85	5.77	614.85	351.7
Wax candles,	8.41	42.05	5 90	632.25	383 1
Stearic candles,	8.82	44.10	6 25	669.10	374.7
Tallow candles,	12.00	60.00	8.73	933.00	505.4
Electric light,	None	None	None	None	13.8

It is thus seen that, as compared with the electric light, gas consumes over seventeen times as much air, vitiates three hundred and fifty times as much, and then, adding insult to injury, gas heats the foul residue twenty times as much as the electric light would do.[1]

In a recent address before the British Association,[2] Mr. Preece shows that gas absorbs 68 watts, whilst electricity (arc) absorbs only 5, and the glow light but 3 watts, as the energy required to produce a light of one candle-power. He also shows that in London the cost of producing one candle-light for one thousand hours is, for gas, 30 cents; oil, 16 cents; electricity (glow), 18 cents; and arc, 3 cents.

There is, therefore, no excuse for longer delay in introducing this superior form of illumination into public meeting places. The long-suffering public should arouse their masters to a knowledge of their duty in this respect. The latter have no longer even the excuse of financial expense.[3]

But there has grown up a somewhat popular notion

[1] For those especially interested in the subject, besides the references given, relating to the relative production of heat, carbon dioxide, and other combustion-products, and their influence upon health, the following may be of service: Cohn, Untersuchungen ueber Tages und Gas-Beleuchtung, Berl. klin. Woch., 1885. Cohn, Ueber den Beleuchtungswerth der Lampenglocken, Wiesbaden, 1885. Cohn, Studien, etc., Vierteljahresschrift f. öff. Gesund., Bd. xv. Heft 4. Pettenkofer, Archiv f. Hygiene, Band 1, p. 210. Reuk, Centralblatt f. Electrotechnik, 1885, p. 210.

[1] From experiments made in the hall of the Birmingham Festival (14) it was shown that when gas was used the temperature near the ceiling rose from 60 to 100 degrees after three hours' lighting. This was equal to adding 4230 persons to the full audience of 3100. The vitiation of the air was equal to that produced by 3600 additional persons. When electricity was used the temperature rose only 1½ degrees in seven hours, and the air was, of course, not vitated at all.

[2] See Science, Sept. 28, 1888.

[3] As to this aspect of the question see some most interesting and suggestive extracts from Lodge's Modern Views of Electricity, in Science, Sept. 28, 1888, p. 153.

that the electric light is hurtful to the eyes, and one finds, even in the literature of the subject, some very absurd prejudices and nonsensically windy disquisitions concerning the noxious action of the mysterious "chemical rays" said to predominate in the electric light spectrum.

Having had a number of patients who persisted in ascribing certain ill-defined ocular affections to the action of the electric light, I determined to see what evidence existed of the supposed noxious influence. The following is the report of the cases published of ocular troubles resulting from an exposure of the eyes to the electric light, and of the conclusions deducible from their consideration. I may say that, so far as my own experience is concerned, I found in my patients who complained of the electric light, that their ocular troubles could usually and easily be accounted for by some error of refraction, overwork, etc.

The question of nomenclature may be noticed in passing. The term *electric ophthalmia* has been proposed and used of the ocular affections to be described. But the popular use of the word ophthalmia confines it almost exclusively to conjunctival troubles, whilst if not others, there are evidently retinal lesions in these cases. Moreover, there is no sense in the term electric ophthalmia. Electric light ophthalmia would be less criticisable, though still very objectionable. Electric sunstroke, electric light sunstroke, etc., are highly ridiculous in themselves, besides importing into the agency the element of heat, as certainly present in sunstroke, as it is certainly absent in the ocular injuries of the electric light. We, therefore, must use some circumlocution to describe these cases.

I proceed at once to give a condensed *résumé* of the cases so far reported in which the electric light was the cause of ocular troubles. They number twenty-three, though several cases are evidently included in Defontaine's account.

1. Terrier (26)[1] cites a letter of Professor Gariel stating that Foucault, in 1843, was attacked with a severe ophthalmia, due, according to his own belief, to the electric light. No particulars are given.

2 and 3. Two chemists, according to Professor Charcot (2), following some experiments in fusing certain substances with a 120 cell Bunsen battery, were seized during the night with pains in the eyes, luminous sensations, and erythema or "electric sunstroke of the face." The ocular troubles were less severe than the cutaneous erythema. There was desquamation of the affected skin in four days. Charcot attributed the injury to the chemical rays, and recommended spectacles of uranium, which substance retains a large proportion of these rays.

4. Little (12) reports the case of a gentleman, who in experimenting in a laboratory, with the electric light, neglected upon one occasion to protect his eyes with his dark glasses. His right eye was exposed to the light. He was blind for a few minutes, and for several days thereafter he had great photophobia and headache. Two months after this accident the physician was consulted on account of dimness of vision and dark spots before the right eye, whose acuteness was $\frac{20}{L}$. Ophthalmoscopic examination showed the optic nerve and adjacent retina affected. Tinted glasses and rest were ordered. No subsequent history.

5 and 6. A case is reported by Rockliff (9) of a workman whose duty it was to adjust the carbon points of a 3000 candle Siemen's light. He used no protecting spectacles, and was for some moments "seized with paralysis of the retina." He had often been troubled with lachrymation, photophobia, pains, and swollen eyelids. These he treated himself by the application of cold compresses. Once, however, this was insufficient, and the distress and swelling of the lids increased. The eyes were hot, red, and the swelling and injection extended to the forehead. The pains were intense within and about the globes. The conjunctivæ were scarlet, the photophobia and lachrymation excessive. The cornea was not affected. The symptoms disappeared in forty-eight hours under lead lotions and systemic purgation. His assistant was also, but less severely, attacked with conjunctivitis, etc.

7. Emrys-Jones (11) reports the case of a patient, who, in making some experiments, had to approach within a few inches of an arc lamp, thus exposing his unprotected eyes for some twenty minutes to the light. There followed a dazzling sensation, and colored circles seemed to surround the street lamps. Early the next morning there was great pain in the eyes, and a great flow of tears. The photophobia and conjunctivitis continued until the subsequent day, when complete relief is said to have followed the instillation of atropine.

8. In a second case of Emrys-Jones (11) the patient seems to have experimented with the electric light, frequently looking at it through a narrow opening between his fingers, though often neglecting even this precaution. With a light of a 2000 candle-power the consequences were only temporary, when viewed from a distance of a dozen feet, and when the gaze was not continuous. If the eyes were not protected by smoked glasses, and were brought within eighteen or twenty-four inches of the arc, the duration of the exposure being one or two minutes, a certain degree of inflammation resulted. A too strong current, producing a violet light, or an insufficient one, producing an orange light, results in less trouble to the eyes than the normal current strength—white, tinted with a sky-blue. Irregularity of the light is more dangerous than when it is steady. The patient reported that his first symptom was a sensation as of a multitude of duplicates of the arc; or, with movements of the eyes, a blinding glare, very confusing for a time, and forming a sort of screen before objects. At first the image was the same color of the arc, but soon this gave place to the complementary color which persisted longer, and which disappeared very slowly. When this had entirely passed away it could be recalled by rapidly opening and closing the eyelids. The severity of the lesion was proportionate to the length of time afterward that the patient could thus reproduce these images. If this were during one

[1] The reference numbers throughout the article refer to those of the bibliography appended.

hour, the patient knew that the inflammatory symptoms would finally ensue, and so he proceeded at once with the remedies that would serve to cut short the attack. The patient had had three separate attacks, accompanied by the usual symptoms of a feeling as of dust in the eyes, lachrymation, intolerable pain, etc. Lotions of sulphate of zinc and opium were used. Patient had not noticed any swelling of the lids.

9. Nodier's case (7) was that of a naval officer whose duty it was to experiment with the electric light. The light was equal to 1600 Carcel jets, surrounded by a glass 40 cm. from the focus, and the officer's eyes were subjected to this light for two hours without protecting spectacles. This was followed soon by headaches and pains in the eyes. The next day the conjunctivæ were red; there were lachrymation, sclerotic hyperæmia, pericorneal circles, myosis, photophobia, muscæ volitantes. These symptoms disappeared slowly in three days. Both eyes were affected alike, and there was no erythema of the skin. The diagnosis was hyperæmia of the retina and conjunctiva. The treatment consisted in zinc collyria, tepid compresses, and rest.

10. In a similar case reported by Nodier (7) the light was only equal to 300 Carcel jets, and the symptoms were light. There were slight cephalalgia, pricking sensations of the eyes, profuse lachrymation. The hyperæmia, pericorneal circle, sclerotic congestion, myosis, and photophobia were only of one eye. The attack passed off in twenty-four hours. The treatment consisted in atropine instillations, belladonna ointment above the orbit, compresses, etc.

11. Dr. Dujardin (26) describes the case of an electrician whose occupation was to charge the accumulators, and who subjected his eyes to the influence of a strong spark. There was photophobia and redness of the bulbar conjunctiva for twenty-four hours.

12. In a communication of Dr. Martin to Dr. Terrier (26) the case of M. L. is described. He had been present at the electric welding. He had worn protecting colored glasses, but in order to see more exactly he had taken them off for a moment. No evil results were felt until night, when he was seized with intense heat of the face and eyes, lachrymation, and such great pain in the eyes that he was unable to open them, and believed himself blind. The pain increased to real torture, the face was injected, the skin thick and rough, and hot. Tears flowed down the cheeks, the lids were swollen so that they could not be opened, the spasmodic closure of the same, and contractures of the facial muscles being increased by the attempts of the physician to examine the eye. By the aid of cocaine, it was found that the white of the eye was but little injected, the cornea intact, the pupil contracted. The palpebral conjunctiva was scarlet, but not swollen, the vision normal. Soothing collyria and cocaine were administered, and the ocular symptoms gradually disappeared in a day or two. The skin of the face was affected more than a week.

13. Sous (23) records the case of M. D., who, though protecting his eyes with dark blue glasses, often looked closely at an incandescent light used to illuminate the work. During the night he was seized with violent pains in the eyes. His eyes and orbits seemed filled with coals of fire. There was intense photophobia, not a ray of light being permitted by the patient. A cherry-laurel water lotion was prescribed, and recovery followed in two days.

14 to 20. Terrier (26), quoting a letter of Dr. Faucher, cites the cases of Messieurs Faucher, Morin, and four assistants, who, from the effects of the intense light in some experiments, had an intense congestion of the conjunctivæ for three days, together with very painful sensations of heat, dryness, and as if foreign bodies were in the eyes. One of the workmen had also an intense "electric sunstroke" of the hands and face.

21. According to Terrier (26), a Mr. N., of Lille, after being present for one and one-half hours during the welding of some metals by electricity, remarked immediately that his eyes were very red. The injection of the eyes and erythema of the face continued that day, and during the evening he noticed malaise, heaviness of the head, and feverishness, with painfulness of the eyes. During the night, there were intolerable pain and intense photophobia, with lachrymation, which continued for a day or two; he was able to return to his work in four days. The treatment consisted in applications of ice and cocaine instillations.

22. Defontaine (22) describes the "electric sunstroke" of the workmen employed in the electric steel-welding works at Creusot. The intensity of the light is equal to about 10,000 Carcel lamps. The men do not approach nearer than fifteen to thirty feet, and though there is at this distance no heat, they begin to feel, within two hours, a burning sensation in the exposed skin of the face and neck, described by one of the men as exactly like that previously experienced by him in a veritable case of sunstroke. The skin is sensitive to the touch, and of a reddish bronze hue. Though the eyes were protected with glasses so dark, that seen through them the disk of the sun was hardly distinguishable, there soon followed a temporary blindness of a few minutes, and for an hour or more thereafter objects seem to be suffused in a decided yellowish saffron hue. The conjunctiva was very hyperæmic, and this lasted for forty-eight hours. There was the extremely painful sensation, as of a foreign body under the lids, and lachrymation was excessive. Cephalalgia and insomnia with slight feverishness were noted. Within the next five days there was desquamation of the entire face in large sheets.

23. Terrier (26), in describing a similar case to the last, notes especially that vascularization of the conjunctiva was particularly noticeable in the part exposed by the opened lids, and when the conjunctiva was covered by the lids there was hardly any injection. It may also be remarked that, unlike all others, he found the pupils dilated. They were little sensitive to light.

If from a review of these cases we try to make up a clinical picture of the disease, we at once strike upon the etiology, and therein lies the greater part of the differences that have arisen in the discussion of the subject. To this *vexata questio* we must direct our attention.

The first fact that strikes our attention is that the subjects were nearly all scientific experimenters, or workmen about the light who were compelled to approach either very near the same or to leave their eyes a long time subject to the influence of the rays. So far as I have found, there is not a single well-authenticated instance of ocular trouble from the use

of the electric light as a simple illuminant. It is a fact well known that we may blind ourselves permanently by staring into the sun, and yet diffused sunlight is, of course, the natural stimulus of the eye. Whatever prejudice may linger in some minds against the electric light properly used as an illuminant may therefore be dismissed as absolutely without clinical proof.

We next notice that the cases cited occurred in those not protecting their eyes in any way, or insufficiently. With this fact we come to the consideration of the real cause of the lesion. It has been ascribed to the supposed excess of chemical (blue, violet, and ultra-violet) rays in the electric light spectrum. Let us see how far this is true.

Rendering the yellow rays equal in the spectra, Meyer (*Centralblatt für Electro-technik*) has analyzed the spectra of the two forms of electric light, with solar light as a term of comparison, with the following results:

	Gas.	Incandescent lamp.	Arc lamp.
Red . . .	4.70	1.48	2.09
Yellow . . .	1.00	1.00	1.00
Green . . .	0.43	0.62	0.99
Blue . . .	0.23	0.21	0.87
Violet . . .	0.15	0.17	1.07

It is thus seen that all three lights are reddish-yellow as compared with the sun, and that even the arc light is poorer in blue rays than sunlight. This, of course, relates to the visible portion of the spectrum. As to the ultra-violet portion, Mengeaud (13) says that M. de Chardonnet photographed the spectrum of an incandescent lamp (like Edison's) and found that it did not exceed that of the visible spectrum. This may have been either because of the absorption of the ultra-violet rays by the crystal globe surrounding the lamp, or because the short rays are not produced. If, therefore, these investigators are to be relied upon, and there seems to be no reason for doubting them, there is absolutely no ground for the great burden of complaint that has been brought against the violet and ultra-violet rays of the electric light. They either do not exist or, if so, they are in less quantity than in sunlight. The recommendations of Javal (6) and Fieuzel (6) to use yellow spectacles to shield the eyes from the baneful effects of the short waves, thus fall flat.[1] Cohn calls attention to the fact that the blue rays are not harmful to the eyes, Graefe and oculists of all times having habitually recommended bluish-tinted glasses.

[1] Another reason urged for the adoption of such lenses is that they obviate the chromatic aberration of the eye, by which, theoretically, the focus of the red rays is behind that of the violet. But Helmholtz could not find that visual acuteness was at all lessened by this chromatism. Javal says it is, and that artificial light is insufficient, widens the pupil, and makes the chromatism of the eye perceptible. He would therefore shorten the spectrum, but not by blue glasses which cut off the red end and thus lessen the amount of light-stimulus; but by yellow glasses, that cut off the blue end. It is a case of hypercriticism and supersubtlety.

The theory of M. de Chardonnet (17) holds that all the ocular media absorb more or less the ultra-violet radiation, and that to this absorptive power is due the fatigue of the eye. He found (18) that the crystalline has especially the function of intercepting the ultra-violet radiation, but this brings doubly into view the absurdity of the theory; there is no question in the reported cases of lenticular trouble; it is chiefly retinal or conjunctival, if not entirely so. Not only are there no ultra-violet rays to absorb, but the body that absorbs them is an insensitive, unaffected organ.

Over-refinement is carried a step further in the theory of Regnault (1), who ascribes the ocular troubles caused by the electric light to the fluorescence developed in the media of the eye by the action of the violet and ultra-violet rays. He showed that the mammalian cornea is manifestly fluorescent, and the crystalline also, and to a high degree; that the phacocine or central portion of the crystalline is not so; that the hyaloid membrane is the only tissue of the vitreous having a weak fluorescence; and that the retinal fluorescence is weaker than that of the crystalline.

I think we may throw out all theories that explain the lesions as due to a greater or less proportion of the waves of the different parts of the spectrum. Since time began our eyes have been accustomed to all colors, and, besides, the waves deemed especially harmful are innocent by comparative non-existence. To what then shall we credit the trouble? I believe it is due simply to the intensity or amount of the stimulus which, from the natural and physiological stimulus of diffused sun or electric-light illumination passes, by closeness or by duration of observation, into pathological irritation and even a quasi-mechanical injury. It is simply a question of degree. From the delicate tint of a cold blue through to the more powerful waves of the red end of the spectrum, up to direct gazing at the electric light or the sun, and to the effect of a sheet of lightning (that has produced blindness) it is only a question of intensity or quantity of the self-same stimulus. A temperature of 98° F. is pleasant to the body, but one of twice that amount coagulates its albumins. There is in Italian a gruesome word, the sad record of a savage age: *abacinare*—to hold a heated glowing vessel close before the eyes until vision is destroyed, or but a shimmer of light is left. The idea was not to burn the eyeballs, but to destroy the retina by the intense stimulus. Czerny[1] focussed direct sunlight upon the retinæ of animals. There followed coagulation of the retinal albumin, destruction of the rods and cones, and severe inflammation of the retina and choroid, ending in atrophy of the retina. When

[1] Sitzungsberichte der Wiener Akadamie der Wissenschaften, Bd. 56, Abth. 2, S. 409.

gaslight was used these results did not take place, but, though tinted glass was interposed, the effects always ensued with sunlight. Deutschmann[1] showed essentially the same fact by inserting in the path of the sun's rays a glass tube filled with cold water, some 20 cm. long. The destruction of the retina was the same as if the warm rays had not been intercepted. The descriptions of cases of snow-blindness—*e. g.*, those of Graddy[2]—read almost exactly like those I have summarized. The same may be said of those cases of injury from exposure to sunlight such as described by Drs. W. Norton Whitney,[3] Sulzer,[4] Haab,[5] Deutschmann,[6] and others who describe retinal injuries from the observations of eclipses, etc., despite the use of protective blue glasses. There is central scotoma, reduced vision, loss of color sensation, photophobia, etc. In Whitney's cases there was a pearl-white spot at the macula, as if its albumin had been coagulated. Briere[7] had a case of complete blindness from the reflex of a lightning-flash from the white street, and Little (12) had a case of blepharospasm lasting thirteen days, from a lightning-stroke.

It is to be noted that the effects of the electric light are not because it is more intense than sunlight. It is, in fact, far less intense than sunlight. Multitudes of people impelled by curiosity have gazed at the ordinary arc or glow lights without a single case of ocular injury. Hardly one would be able to look into the sun in the same way. All the cases of ocular injury from the electric light are due to gazing at it at very short range and for a long time. Compared to daylight, the electric light lessens colors, for red, blue and yellow, one to two, three, and, for red, even four. In the establishments for electric welding the great intensity or number of the light waves is so high that not only are the delicate retina and conjunctiva injured, but the skin wherever exposed is inflamed and desquamates from a short exposure to the near and powerful stimulus exactly as it would if exposed to the sun's rays upon a hot summer day.

Another proof that the injury is due, not to a different proportion of the long or short waves, but simply to their great quantity, lies in the fact that the ocular trouble is exactly proportional to the intensity of the light, or, what amounts to the same thing, the nearness of one's approach or duration of exposure. This is particularly clear in case No. 8. I have elsewhere[8] endeavored to show that the retinal intermediate of light and color sensation is a molecular vibration responding, and proportional to the wave-length and number of the received ether-waves—or, in other words, that the retinal function is a delicate and high differentiation of the temperature-sense. Now, just as a certain degree of heat or molecular vibration is grateful and necessary to the general nerve end-organs, but a much higher degree is destructive of them, so it is the same with the retina. Every fact adduced above, together with the symptomatology and pathology of sun-blindness, snow-blindness, etc., goes to show the truth of this conception. Excess of physiological activity everywhere runs into pathological activity. The light of the ordinary glow or arc lamps when diffused, or not looked at directly, is not injurious to the eyes. Neither is it injurious if looked at from a distance (several feet, or thirty, according to its intensity), unless the gaze be fixed upon it for a length of time that more than compensates for the distance. The injury is proportional to the intensity of the light, to its distance, and the duration of the exposure. It may be said that there is absolutely no danger from the use of the diffused light as an illuminant. They who have the care of these lights—scientific experimenters and workmen in the welding-works—such must protect their eyes with colored glasses, whose function is simply to arrest the great part of the numbers of the light-waves, so that the intensity of their action is reduced. It matters not whether the long or the short waves are intercepted,[1] so enough of them are cut off to reduce the general average to a standard approaching that of diffused daylight, the normal stimulus of the eye. The indication is for a London smoked or dark-blue tinted lens, the depth of whose shade should be proportional to the nearness of approach and the intensity of the light.

As to the symptomatology of the ocular affection, there is the greatest unanimity in all the cases. If the light has been very intense and the exposure at short range, there will probably be a temporary "paralysis of the retina," lasting one minute or several, and accompanied by blepharospasm. There may be a blinding glare, positive and negative after-images, central scotomata, or other chromatic sensations, as of colored circles about objects, etc. In any case, what may be called the typical symptoms appear in from two to twenty-four hours after the exposure. There is then always photophobia (with blepharospasm) pronounced and intense. Lachrymation is always present, and the third unfailing symptom is pain in the eyes, which, probably, also extends to the head. The intolerable ocular pains are usually accompanied by a feeling as of particles of sand under the lids, and these particles seem large, recognizably distinct, and unendurable. The

[1] V. Graefe's Archiv, Bd. 28, Abth. 3. S. 241.
[2] Amer. Journ. Med. Sci., Rep. on Oph., 1887.
[3] Annual of Un. Med. Sci., 1887, vol. iii. p. 91.
[4] Klin. Monatsbl. f. Aug., April, 1883.
[5] Correspondenzbl. f. Schweiz. Aerzte, 1882, p. 383.
[6] Graefe's Archiv, Bd. 28, Abth. 3, S. 241.
[7] Gaz. des Hôp., 1876, 333.
[8] Amer. Journ. Oph., July, 1886.

[1] See case 8.

conjunctiva, especially when exposed to the direct action of the light, is congested, usually intensely so; there is sclerotic hyperæmia, pericorneal circles, and myosis.[1] During the attack ophthalmoscopic examination is scarcely possible, and would probably show nothing of importance, since the symptoms are almost entirely those of a reflex neurosis, due to conjunctival irritation. The attack lasts from one to three, or even more, days, and may be cut short by the rational indicated treatment.

The prognosis is good; no case of permanent injury having been so far reported.

As to the treatment, a mydriatic should be used to set at rest the ciliary muscle, and cocaine to relieve the pain, the irritation, and reflex spasms of the muscles. Astringent collyria are wholly useless, and might prove injurious. Cold compresses have been usually employed, but I should use hot ones if a case were presented to me.

As regards the pathology of the affection, Nodier (7) ascribes the conjunctival hyperæmia to the retinal lesion by reflex action, that produces spasmodic contraction of the muscular fibres of the iris and ciliary body, whence results compression of the irido-choroidal venous trunks with venous stasis, or reflux, of these and of the conjunctival vessels. Nodier had not had any such experiences as those described in cases 12, 14, 22, 23, in which the skin of the face, neck, or hands was affected. Case 23 is particularly instructive, as showing that the conjunctiva was injured by the direct action of the light, and only where it was exposed to the same. Heimann[2] thinks the conjunctivitis (*sic*) is due to the pressure of the lids on the eye in the spasmodic action of the orbicularis under intense light. The whole matter seems simple enough and easily explicable. The fact that photophobia, lachrymation, pain, etc., are not symptoms of retinal lesions and inflammations, seems to make Nodier's assumptions purely gratuitous. These symptoms are the infallible results of irritation of the external tissues, the conjunctiva, cornea, etc. This irritation certainly exists in electric light injury: it affects all exposed parts, and is most intimate, penetrating, and severe. It simply results in vaso-motor paralysis by pure reflex action, and there follow as inevitable and necessary consequences the outflow of tears, the vascularization (not conjunctivitis) of the conjunctiva, etc., the blepharospasm, the photophobia, and the pain.

Summing up the conclusions reached, I should say that:

1. As regards general hygiene, the superiority of the electric light over gas as an artificial illuminant is so overwhelming as to admit of no discussion. It is incontestably the light of the future, and the public should not rest until its meeting-places, such as theatres, halls, reading-rooms, churches, etc., are lit by the most perfect system at its command.

2. A study of the published cases of injury of the eyes by the electric light shows that not one was due to the use of the diffused light as an illuminant.[1] The popular prejudice against such a use of it is absolutely without justification. All the cases reported were of scientific investigators, etc., or workmen about the light, who approached it very closely, gazed at it protractedly, and without protecting colored spectacles

3. The ocular injury is due, not to the supposed preponderance in the electric-light rays of violet and ultra-violet (chemical or actinic) waves, but simply to the greater number (intensity) of the usual length light-waves.

4. The symptoms of the ocular injury are possibly immediate temporary "retinal paralysis," blepharospasm, central scotomata, chromatopsia, after-images, etc. Within twenty-four hours there come on intense photophobia, lachrymation, ocular pain, a feeling as of foreign bodies beneath the lids, conjunctival hyperæmia and congestion, pericorneal circles, etc.

5. The attack usually lasts but two or three days; the prognosis is excellent; the treatment is simply cocaine and atropine instillations and cold or hot compresses.

6. Workmen and experimenters who must approach closely to the electric light should protect their eyes by smoked or tinted glasses, the depth of the tint being greater where the light is more brilliant, the proximity greater, or the exposure longer. In the welding-works the workmen must be particularly careful about this, and must also not expose the skin of the face, neck, and hands to the action of the light. The precaution may not be amiss to advise the curious against testing their eyes by gazing at the ordinary arc and glow lights at short-range.

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[1] I hardly understand how there could be mydriasis, as in one instance reported.

[2] Prager Vierteljahrsschr., Bd. 100, S. 200, 1868.

[1] I have not alluded to a common complaint against the arc lamp that it is injurious because of its changeableness or flickering. This was and sometimes is exceedingly uncomfortable. With the rapid improvements being made, and especially with the improved Edison glow light, the complaint is fast becoming groundless.

[2] *Note:* It is rare that the Germans are caught napping, but I doubt if a single one of the above articles is indexed in Michel's Jahresbericht der Ophthalmologie.

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THE ARREST OF HEMORRHAGE FOLLOWING EXCISION OF THE TONSIL.

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PERSISTENT hemorrhage after excision of the tonsil is extremely rare, but such instances are occasionally reported, and the subject has recently been discussed and means for its arrest suggested. There have occurred cases in which the methods usually recommended would be entirely impracticable.

I have seen but a single case in which profuse and dangerous hemorrhage continued after the operation. In that instance an unnecessary entire removal of the tonsil had been effected by the form of guillotine that draws out the mass before the cut is made.

At my first visit to the patient, a male adult, he had bled freely for some hours and was blanched and exsanguinous. Various inefficient expedients had been resorted to, including the application of cold and temporary pressure. Of course, there had been used Monsel's solution—the vilest of the abominations called styptics—a class of remedies which declare the inefficiency of the surgeon, and have caused more hemorrhage by masking its source and by loss of time, than they ever arrested.

After excavating from the mouth and fauces the masses of hard, black clots produced by the iron solution, the cut surface was seen bleeding freely.

All bleeding was instantly arrested by simply passing an ordinary tenaculum firmly through the tissues of the base of the tonsil, and giving the instrument a decided twist. The torsion effected, compressing the oozing vessels, was maintained by closing the patient's jaws on the handle of the tenaculum as it protruded from the mouth. The jaws were then securely held together by a firm bandage about the head, from the chin to the vertex.

Before resorting to the expedient with the tenaculum, it had been my intention to transfix the base of the tonsil with a curved needle, place a ligature tightly behind it, and leave it in position, after nipping off its point, and bringing the end of the thread out of the mouth.

After the arrest of the hemorrhage the patient rested through the succeeding night, experiencing apparently no annoyance from the presence of the tenaculum.

I may remark, in illustration of another expedient for arrest of hemorrhage after tonsillotomy, that at my visit on the next morning I was prepared, in case hemorrhage should recur on the removal of the tenaculum, to pass one or more ligatures through the base of the tonsil, and for this purpose had ready for use needles of short curve, fixed in needle-holders. A concentric constriction of the base, thus made, would effectually prevent any possible hemorrhage.

In this case no hemorrhage followed on removal of the tenaculum, after it had remained twelve hours in position.

In a case of hemorrhage after excision of the tonsil, recently reported, the operator was able to seize the tissues with a volsella and apply a ligature. In occasional cases the difficulty or impossibility of thus applying a ligature to isolated vessels is due to the flatness of the surface and the lack of loose tissue to be grasped.

Considering how full is the arterial supply of the tonsil, it is remarkable that hemorrhage does not frequently occur in the operation of its excision. On injecting, in the cadaver, the vessels supplying the tonsil, I have been impressed with its varied vascularity, derived mostly from the inferior laryngeal, the lingual, and the palatine arteries; and I wonder if it is always realized that the internal carotid artery actually touches the base of the tonsil, especially when that vessel, describing a curve, with the convexity inward, as it frequently does, seems really to bear against it.

THE TREATMENT OF PERITONITIS.[1]

BY ARTHUR V. MEIGS, M.D.,
PHYSICIAN TO THE PENNSYLVANIA HOSPITAL.

THE question how to treat peritonitis is one of the greatest importance, and upon the decision eventually reached will in the future depend the lives of many patients. Should the leaders of our profession decide that the administration of saline purges is the best treatment, and this be for a few years taught in the schools, the ordinary practitioner will soon acquiesce. If such a consummation is to be deplored, now is the time for us who are of the contrary way of thinking, to protest.

To me it seems clear that before any conclusion can be reached, it must first be acknowledged that peritonitis, as ordinarily seen, diagnosticated, and treated by physicians, is so different from the lesion or disease which has been successfully dealt with by surgeons by the administration of saline purges, that it must be recognized that, from the standpoint of therapeutics, the two questions are as far apart as though they were two widely differing diseases.

As a therapeutic measure, no one disputes the wisdom, under some circumstances, of making an attempt to abort an inflammation; and yet it is equally well known that such an attempt, when made after the inflammation has progressed so far that to abort it has become impossible, must not only fail, but, equally certain, will be productive of positive harm. It is a common rule of treatment, and one that holds good in the great majority of instances, that an irritated, sore, or inflamed part is to be put as nearly as possible at rest, and that whatever increases the pain suffered is likely to be injurious. Why shall we make an exception to this rule in all cases of peritonitis by giving salines, which throw the bowels into a state of great activity, and increase the pain, at the same time denying the patient opium, which equally certainly relieves?

I have been, and am an advocate of the use of opium in all cases of peritonitis as seen by physicians, but at the same time I have never denied my patients the use of laxative medicine, and it is, I am sure, by the judicious administration, according to the special needs of each particular case, of the two seemingly diametrically opposed drugs that the best results will be attained. The reason, probably, that the use of opium in the disease is being decried is that it has been abused. It should not be given to the point of narcosis, nor should it be expected that in cases of severe peritonitis the pain will be abolished. Measurable relief only should be looked for, with alleviation of the terrible colicky pains so characteristic of the disease in its full development. I have never been a believer in the treatment by the use of anodynes exclusively, and think it absurd to talk—as I have heard—of purging the patient by the use of opium and belladonna. If we had six months in which to work, and could first establish the opium habit in the patient, we might, perhaps, encourage diarrhœa, or at least not interfere with it by the administration of opium. In a disease, however, which lasts usually but a few weeks at the very outside, such an expectation can end but in disappointment.

The treatment that will give the best results, according to my view, is the following: in all cases in which no physical obstruction can be diagnosticated, for which operation must be at once recommended, and this should include doubtful cases in which operation may subsequently become necessary, there should be prescribed liquid diet, small quantities every two hours, and every two hours a quarter of a grain of opium, and one-twelfth of a grain of extract of belladonna. To this may be added, if it should seem advisable on account of pain, the administration twice, or at the outside, four times in twenty-four hours, a one grain powdered opium suppository. At the same time injections of warm water, with or without soap, should be given once to three or four times daily. If flatus is passed, the case continues to be a very hopeful one. This course should be rigidly adhered to for from twenty-four hours to five days, or possibly longer, when the time will have arrived at which it becomes necessary to consider the propriety of using some sort of aperient.

Purgatives are given in peritonitis for two distinct purposes: first, to increase the peristalsis, and thus overcome obstruction; and, second, to induce large watery movements, for the purpose of directly depleting the abdominal, and especially the intestinal, bloodvessels. After operations, inflammation in greater or less degree is so common, and we are so well aware that it is liable to occur, as to be always prepared to meet it. This being the case, it may be met in its very incipiency, and if inflammation can ever be aborted, it is under such circumstances. The explanation of the success, therefore, of surgeons in treating peritonitis with large doses of saline purgatives would seem an easy one, for they deal with a stage of the disease which never comes under the management of physicians, as people in the early stages of the disease do not seek advice, and, besides, if they did, the differential diagnosis between idiopathic peritonitis in its earliest stage and enteritis or mere intestinal irritation would be an impossible one. No one, I think, should deny surgeons the credit their courage deserves for having instituted this revolutionary method of treatment, for, measured by our old standards, it is revolutionary; but at the same time we must not err upon the other side, and with undue haste conclude that the method is applicable to all cases. I have long

[1] Read before the Philadelphia County Medical Society, November 7, 1888.

been of the opinion that the old surgical practice of shutting up the bowels for a week, with opium, after an operation for hemorrhoids, was a bad method.

Having, then, quieted our patient somewhat during the first few days of attendance, with injections and liquid food, and belladonna and opium, and at the same time been very careful not to induce narcosis, or in the least to depress the respiratory forces, for, if we do, the remedy will be worse than the original disease: we must, as already said, consider the propriety of getting the bowels moved. The decision in regard to the precise moment at which this attempt is to be made is, in my opinion, one of the most delicate questions that can arise in therapeutics, and gives to each of us, when we meet it, an opportunity to show a real genius for the treatment of disease. The medicine, however, which shall be given is very easy to decide upon—here there is no inflammation in its early stage, and therefore there can be no question of aborting it. Salines could only act upon the bowels like other drugs, relieving tension, if you like, by abstracting water directly from the intestinal bloodvessels; but, so far as the mere moving of the bowels is concerned, they are by no means so effective, or, as the laity call it, "searching," in their action as some of the vegetable purgatives. Any one who has been called upon to treat cases of fecal accumulation (a paper upon this subject was published some years ago by the author, in the *Transactions of the College of Physicians of Philadelphia*) will have learned how useless and ineffective are salines if the bowels are very sluggish, while small and repeated doses of vegetable purgatives are perfectly satisfactory, and certain in their effects. In such cases salines, and even castor oil, will induce large watery stools, but no fecal matter is brought away, and it seems as though the fluid material had come from below the accumulated feces, or came by, and the patient is no better off than before, though probably he will have suffered much pain. No better combination can be given than a pill consisting of a twelfth of a grain of extract of belladonna, a quarter of a grain of extract of nux vomica, a quarter or an eighth of powdered aloes, and a half or one grain of rhubarb. This should be given at first once or twice in twenty-four hours, and, if violent pain be set up—which, however, seldom happens—it should be stopped, and the opium and belladonna every two hours used again for a day or two, when the attempt with the aperient may again be made. After a day or two the pill may often be given every four hours, and I have often seen the obstruction give way under this treatment, and the patient entirely recover.

It would be most unfortunate, it seems to me, for the science of medicine, and still more so for those who in the future are to suffer from peritonitis, if the treatment of the disease with sedatives should be entirely abandoned, as has been recently recommended. Let us look at the question reasonably, and without prejudice, and in the future assign to one class of patients operation by a competent surgeon, and saline purgatives afterward, if those skilled from a study of the subject in that particular direction judge that to be the proper course; and to the other, a reasonable use of anodynes and injections, with moderate doses of vegetable laxatives when the time comes for their administration. Because, in the past, the sedative method of treatment has been abused, and patients have been hurried out of the world by the unwise management of incompetent physicians who have narcotized them, is no reason why we should cast aside what is good in the method, any more than it would be wise for us now to assume that, because the administration of saline purges is advisable in the surgical treatment of some cases, it is, therefore, to be looked upon as a panacea in the disease, and the treatment to be recommended in all cases.

For my own part, I am a firm believer that the disease may arise idiopathically, and, when I say this, I mean from an attack of enteritis or violent indigestion, or from chilling of the body, just as I belive pleurisy may arise, and, in such cases, it is reasonable to suppose that the inflammation very soon becomes more or less generalized, though, of course, it must have had its origin at some point. Such cases as these, if it be conceded that they ever arise, are not amenable to surgical treatment, for there is no point of special obstruction, and operation could not effect any good, unless by merely cleansing.

In conclusion, I cannot perhaps, better emphasize the correctness of the statement that the treatment by sedatives should not be abandoned in all cases of peritonitis, than by calling attention to the fact that in many cases in the past, and the same thing is certain to occur again in the future, post-mortem examination has demonstrated that the disease was so extensive, or of such a nature as to be necessarily incurable. Under such circumstances, I think no one will dispute that the province of the physician is to do what he can to soothe pain, and to make the last days and hours of the patient as endurable as circumstances permit, and no other one drug will conduce so much toward this end as opium.

THE TREATMENT OF PERITONITIS.[1]

BY J. M. BALDY, M.D.,
OF PHILADELPHIA.

I PRESENT this brief paper to you to-night, not because I have anything particularly new to offer, either in the line of pathology or in that of treatment,

[1] Read before the Philadelphia County Medical Society, November 7, 1888.

but that a full discussion of this most interesting and important subject may perchance be drawn out. The points as I shall present them here are, I know, considered somewhat radical from a medical point of view; but they are views toward which surgeons are gradually drawing nearer and nearer, and of which actual experience is daily demonstrating the value.

Peritonitis arises, as you are well aware, from a vast variety of pathological conditions, and in dealing with it the origin of the inflammation must always be taken into consideration. The plan of immediately putting every case of this disease on the opium treatment is departed, and, nowadays, no one would think of pursuing such a course, in a peritonitis following rupture of an abscess, for instance, provided an abscess was known to have ruptured; nor in the case of a penetrating wound of any of the hollow viscera, with extravasation of its contents into the peritoneal cavity.

The first thing to be established when called to a patient suffering with peritonitis, is the cause of the trouble. This is not by any means an easy thing to do. A case may present all the symptoms of peritonitis, and on close examination an inguinal hernia be found. The temptation here is immediately to set this down as the cause, and proceed accordingly, especially if the hernial mass is tender, and presents other symptoms of excitation, where before it had been quiescent. In such a case one may readily be misled, as has happened to myself, and the real cause found to be something else.

Again, although the books lay down most beautiful rules for diagnosticating the different varieties of intestinal obstruction, it is often impossible to say more than that there is a probable mechanical obstruction of some kind or other, somewhere in the abdomen; but even then one cannot be sure that the obstruction is caused by the peritonitis, and not the peritonitis by the obstruction. I have seen peritonitis in cases in which, on examination, it was not at all certain that the pelvic contents were at fault, and yet an operation has developed the correctness of that hypothesis. One could go on indefinitely multiplying instances of mistakes of this kind, and mistakes which are perfectly justifiable in a majority of cases. It is simply impossible in a large number of instances to do more than guess at the real cause. But although we cannot always detect from a mere examination of a patient the cause of the trouble, it does not follow by any means that the disease has arisen idiopathically. The more I see of peritonitis, the closer and closer am I inclined to draw the line at the idea of an idiopathic origin. I am not yet quite ready to deny the existence of such an origin altogether, but as our knowledge of intra-abdominal troubles has grown, just so steadily has idiopathic peritonitis diminished in frequency.

On the other hand, cases of peritonitis are constantly falling into our hands in which the diagnosis is comparatively easy, and then I think the indications for treatment are plain; while the exact condition of affairs remains in doubt, the best of men may hesitate, and often their hesitation is responsible for the unfortunate ending. Once, however, given a correct diagnosis, there should be no hesitation as to the course to pursue.

To begin with, I must unhesitatingly condemn the use of opium in any of its forms. I think the use of this form of drug, in these diseases, tends rather to increase the trouble than to diminish it; at any rate, if it does not do damage *per se*, it certainly puts the parts in an excellent condition to continue on in the course in which they have started, and blinds us to the damage being done. In a paper read before the Obstetrical Socicty last November, on "The Use of Salines in Peritonitis after Laparotomy," I dealt with the use of this drug quite extensively, and my convictions then stated have been constantly confirmed and strengthened, not only in peritonitis following operation, but in peritonitis from all causes. I may quote the following from that paper:

"Heretofore I have treated cases of peritonitis on the opium plan. In one case I gradually increased the dose of the tincture of opium until the patient received in one day between sixty and seventy grains of the drug. I have never been satisfied with the results of this kind of treatment, nor have I been able to convince myself that it was even logical. We are taught that opium 'puts the bowels in splints,' and in this manner keeps the peritoneal surfaces from rubbing together and increasing the inflammation. But the bowels are already in splints, as it were, and any one trying to make them move will be quickly convinced of this fact; therefore, for this purpose opium is superfluous. The drug relieves the pain, it is true; but oftentimes it does not even do this, excepting in enormous doses. Relief of pain is practically all that opium can do for good, in peritonitis. It, however, does a world of harm; it helps to keep the bowels in splints and so favor the formation of those great masses of adherent intestine which we so often find the cause of subsequent intestinal obstruction; also, the formation of numerous bands of organized lymph which as often bring a patient to grief, in after years; still worse, it closes, by paralyzing all the excretory organs, all the avenues of escape for the poisonous products of inflammation formed in that great lymph-sac, and in this manner supplies material, the best possible, for keeping up and spreading the inflammation, much more surely than the rubbing together of the parietal and visceral peritoneum will."

It also almost invariably causes tympanites, with all the accompanying dangers of over-distention, and, as has happened, death from cardiac paralysis. And further, I may say that this drug lures us into a false sense of security, and benumbs all our desires to make any further effort in our patient's behalf.

The pain and tenderness being relieved, and the sufferer being made comparatively comfortable, we stand by and wait, our waiting as often leading us to the coffin as not, without our even suspecting that our patient is worse. After having stupefied and benumbed the patient, a consultant is perchance called in to the case, only to find his hands tied, by having all the symptoms masked, and with no possible way of knowing what progress the disease is making, but by a surgical procedure, and that, in view of the fact that the patient *seems* better, he dare not propose.

In great contrast to this picture stand the results of the use of salines. Here the bowels are put into active peristaltic action; this motion tends to prevent the formation of adhesions and bands; the peritoneal cavity is drained of the products of inflammation; the inflamed surfaces are relieved of all engorgement, by a thorough depletion of the vessels in the intestinal walls; the inflammation is most effectually stopped; the pulse and temperature almost immediately improve, and the pain is relieved as quickly as can be by the use of opium. This, theoretically, may seem strange, but nevertheless it is a clinical fact.

While writing this paper I was called to a woman sixty years of age. Her knees were drawn up; her abdomen was greatly swollen and tympanitic; the pain was excruciating, and she could not tolerate any manipulation whatever of the belly-wall; her temperature was elevated and her pulse quick; an anxious expression of the face and vomiting were present. The cause of the attack could not be detected, probably only because she could not be handled properly for an examination. Salines were administered, and in much less than fifteen hours the belly-walls were shrunken and flabby, permitting of free manipulation, with hardly any evidence of pain; vomiting had ceased; pulse and temperature were both in good condition, and, in fact, all the symptoms were rapidly disappearing. She passed a most comfortable night, sleeping almost the whole of it. In twenty-four hours more I had discharged the patient, simply with instructions to keep her in bed for a few days longer, and feed her well, in order that she might regain the strength she had lost. I may add that the case had appeared so bad when first seen, that I had notified my nurse to be ready for a possible operation the next day. This same result has followed this treatment so often, and so constantly in my hands that I have come to look for it with certainty as soon as the bowels can be made to act. Of course, should we suspect that a strangulated hernia was at the root of the trouble, or that there was pus in the peritoneal cavity, or that the intestines were obstructed by an organic lesion at any point, we would not think of resorting to purgation, but would immediately turn to our surgical resources.

The sources of a peritoneal inflammation are so numerous, it would be useless to attempt to enumerate them further; but the general rule might, I think, be safely laid down, that where it can be demonstrated that the disease is caused by an organic lesion, abdominal section is indicated, and that in addition those other cases which refuse speadily to yield to purgative treatment, should be immediately dealt with in the same manner. When a pus sac is known to be at the bottom of the trouble, or an appendicitis is in existence, it is folly to fool with drugs of any kind; and where drugs are used and relief does not quickly follow, whether the cause is known or not, it is equally unwise to delay longer. The source of the disease once removed, the peritonitis will rapidly disappear.

Cases reported in the journals are constantly demonstrating the worthlessness of all medical interference, and are steadily pointing to the fact that peritonitis is preëminently a surgical disease, and should not be intrusted in the hands of a purely medical man, but should be always and at once turned over to the surgeon. An article by Mr. Tait, in a recent number of the *Annals of Gynecology*, sets this forth in flaming colors. The very first case reported by him was one of purulent peritonitis, which had been tinkered with, until even the operation he performed was too late to save the woman. An abdomen containing pus, either encysted or free in the cavity, whether produced by puerperal disease or any other, demands opening and removal of that pus from wherever found. If there is not active peritonitis present, the person afflicted is liable at any minute to be so attacked. This fact does not seem to be sufficiently understood, and physicians are constantly treating pelvic abscesses with local applications, electricity, etc., sometimes suspecting the true condition, at others, mistaking it for some other condition, such as tubal pregnancy, for instance, as has been done lately by one of the most prominent advocates of the electrical treatment for extra-uterine pregnancy, in this country.

Where an intestinal obstruction, an appendicitis, an inflamed tubal condition, a penetrating wound of any of the viscera, a tumor, or any of a dozen other troubles are found, they should be dealt with according to our present surgical light. In such cases as these peritonitis is not a disease, but merely a symptom, and when the original cause is removed the trouble subsides at once. Often the mere opening of the abdomen, together with irrigation and drainage, is sufficient. This seems especially to be true of those cases of tubercular peritonitis, so many of which have lately been springing up, and to which I called attention in my paper on "Exploratory Laparotomy" last spring. Then I was able to show that six deaths from various causes had taken place out of thirty-six, collected in Germany, and only

one death out of seventeen cases which I had collected in this country. This death was due, not to the operation itself, but to defects in the details of the operation. In all these cases irrigation or drainage, or both, followed the operation, and seemed all that was needed to effect a permanent cure. It is useless to take up your time by quoting cases—literature is teeming with them, and almost every journal picked up contains a lesson.

To sum up the conclusions of this brief paper, I should say that when called to attend a patient suffering with peritonitis, we should first determine the cause, and if it is found to be an organic one, the immediate use of the knife, followed by irrigation and drainage, is the only proper method of procedure.

Should the cause be found to be functional, the use of purgatives, followed, if necessary, by enemata, is indicated; and these failing to relieve quickly, surgical methods should soon follow.

If the case is of doubtful character, I would be inclined first to try the purgatives, and stand ready to interfere with the knife at a moment's notice.

Of course, it is impossible to lay down any absolute general rules for the treatment of every case, as each and every one must be a study of itself; and yet, as nearly as rules can be laid down, the above seem to me to be the proper ones.

EFFECT OF ANTIPYRIN ON THE SECRETION OF MILK.

BY T. HAVEN ROSS, M.D.,
OF BUFFALO, N. Y.

THE following case I think worth reporting, and I hope that further proof of the action of antipyrin in suppressing the flow of milk will be forthcoming from other members of the profession, as it is a simple and usually safe medicament.

The notes of this case as taken from my record are as follows:

"October 27, 1888, 9 A. M., was called to see Mrs. ——. She had taken her child (sixteen months of age) from the breast the previous evening, and at the time of my visit was experiencing much pain and discomfort from the distention of her breasts. Ordered breast-pump applied, which drew off eighteen fluid-ounces of milk; also ordered eight grains of antipyrin three times daily. (Had previous knowledge of this patient's tolerance of the drug.) At 3 P. M., eight fluid-ounces were drawn with the pump.

Oct. 28, 9 A. M., six fluid-ounces, and at 6 P. M. three fluid-ounces were drawn.

29th, 9 A. M., two fluid-ounces, and at 6 P. M. one fluid-ounce were drawn.

30th. No milk in breasts. Medicine discontinued.

Pain and discomfort disappeared after first dose of antipyrin. No change was made in the previous rather generous diet. Appetite and digestion remained good."

Reference may be made to an article in the *Bull. gén. de Thérap.*, June 30, 1888, page 554, mentioned in the *American Journal of the Medical Sciences* for October, 1888, page 404.

MEDICAL PROGRESS.

The Local Treatment of Disorders of the Cerebral Membranes.—The local treatment of disorders of the cerebral membranes has always been recommended. For a number of years MOSLER has adopted a derivative treatment in such conditions, with success even in severe cases. In a case of intense meningitis, following upon acute rheumatism, prompt results were attained by the application of a large fly-blister to the shaved head and two behind both ears, after other methods had been fruitlessly tried. The author has used this mode of treatment in various forms of meningeal disease and has demonstrated that extensive counter-irritation (by vesicants or ointment of tartar emetic) applied in the immediate neighborhood of a suffering organ, as directly upon or close to the scalp, is even efficacious in chronic affections of the cerebral membranes. Failure may be owing to the application not being extensive or protracted enough; aspiration, in case of chronic hydrocephalus, was not attended with permanently favorable results. Notwithstanding the compression made after the operation, the exudation reaccumulated. Repeated aspiration of hydrocephalic fluid, however, is well borne. Loebker has punctured the head in two cases of chronic hydrocephalus, evacuated the fluid and applied compression. The fluid returned in a few days. Both children died from the disease.—*Therapeutische Monatshefte*, October, 1888.

Therapeutic opinions upon Ichthyol and its Preparations.—DR. CARL PAULI, of Cologne, writes that upon the merits of the above-named preparation, he finds opinions very much divided. While some hold that it is totally useless, others highly praise its merits. Among the latter is UNNA, who lately has written a monograph upon this preparation, in which he states that he has used it in different affections, but especially in skin-eruptions.

LORENZ adds to this that he found in ichthyol an unsurpassable remedy for acute and chronic articular rheumatism, for gout, mastitis, and contusions, in which troubles the curative actions of this drug were surprisingly quick.

KLONY is of the same opinion (*Therapeutische Notizen von Rabow, J. C.*, 1886, No. 9). He treated at sea a number of shin-bone affections with ammoniated ichthyol and oil of turpentine, with marked results. According to him, after the application of this drug to the painful surface, pain disappears, a blister taking its place.

The opinion of KLAMANN is not quite so favorable ("Treatment of Erysipelas with Ichthyol," *All. Med. Central Ztg.*, March 26, 1887). He states, "that although he has obtained some satisfactory results from its use in erysipelas, he found that in the more severe cases it was unable to retard the progress of the affection, and he was compelled to return to his old but surer remedy of terpentinphenol, in conjunction with the internal administra-

tion of salicylate of sodium and tincture of aconite." Klamann likewise states "that the drug in question showed no material action upon articular rheumatism, while upon synovitis its action is at times satisfactory, at times not. With some patients the pain from the burning was so intense that nothing could induce them to submit to a second application."

"My own experience," writes CARL PAULI, "has been that for contusions and distortions there is no drug from the outward application of which we derive greater benefit. The same might be said of its use in lymphangitis, if three cases which I treated with it are worth considering. It was my intention to try ichthyol in erysipelas, but Dr. Oppolzer's old advice to me, 'never throw away dirty water, till you are sure of the fresh,' made me abstain, and adhere instead to Schwimmer's and Gayza Faludi's treatment, which consists in applying the following:

℞.—Carbolic acid . . . . . ʒss.
Olive oil . . . . . ʒj.
Precipitated chalk . . . . q.s.—M.
Make a soft paste.

"I can say but little about its use in skin diseases, but suppose that its beneficial action here is largely due to the sulphur it contains. Thus Unna finds it of great use in urticaria, in which disease he says that it surpasses salicylate of sodium and atropine. As to the use of ichthyol in articular rheumatism, my observations concur with those of Klamann. I might state here that an old lady, a sufferer of more than twenty years from this malady, obtained no marked benefit from its use, but continued to rub it in the affected parts at night, as, according to her daughter's statement, she slept better after the application."—*Deutsche med. Wochenschrift*, October 25, 1888.

Treatment of Cancer with Intraparenchymatous Injections of Ozone-water.—DR. IGNAZ REICHERT, of Aschaffenburg, gives an account of a case of cancer treated according to the methods of Dr. Schmidt, which consists in the intraparenchymatous injections of ozone-water

The patient, a widow, born May 31, 1821, presented herself with an epithelial carcinoma of the left cheek, which she attributed to a wart which had formed there four years ago, and had become inflamed through repeated irritation. The carcinoma was of the size of a quarter of a dollar, its edges red and infiltrated. The needle of a Pravaz syringe permeated its substance as though it were butter; the neighboring lymphatics were not enlarged.

The patient was treated from May 15th to July 24th with intraparenchymatous injections of Lender's ozone-water, the strength of the injections being increased by degrees. Resolution took place rapidly; on July 7th the size of the cancer was reduced to that of a ten cent piece, its body and edges being studded with new granulations, its substance was firm, the syringe entering with great difficulty. From this on, the size of the affected part became smaller and smaller. On July 24th the writer made his last injection. Two days later union had taken place, palpation revealed slight infiltration; the skin of the cheek was of a uniform color.

In a foot-note the writer adds that he submitted Lender's ozone-water to a chemical analysis, and found that it contained a large amount of chlorine, and puts the question: "Is the success of this treatment due to the ozone or chlorine?"—*Münchener medicinische Wochenschrift*, September 4, 1888.

The Milk-curdling Ferment of the Stomach.—DR. E. G. JOHNSON has studied the action of the milk-curdling ferment of the stomach in the clinic of Professor Riegel, of Giessen, and subsequently in the Sabbatsberg Hospital, Stockholm. Researches were made in twenty-four cases on the presence of the ferment and the pathological conditions relative to it. Fourteen of these patients suffered from hyperacidity, accompanied in four of them by moderate dilatation of the stomach. In one of these latter there was also hypersecretion of the gastric juice. One case had considerable dilatation of the stomach, with hyperacidity and marked hypersecretion. In three cases the dilatation was insignificant, but there was hyperacidity, complicated in one case by slight, and in another by very great, hypersecretion; in the third case the hyperacidity was accompanied by chlorosis. Three other patients suffering from hyperacidity were also the subjects of gastric ulcer. Dr. Johnson also examined four cases of hyperacidity with neither dilatation nor hypersecretion, of whom three were chlorotic; a case of catarrhal jaundice, four cases of severe chronic dyspepsia, and five cases of carcinoma of the stomach. The contents of the stomach were removed while the patient was fasting, and also four or five hours after food had been given for the purpose of the observations.

Dr. Johnson sums up his researches as follows: 1. The milk-curdling ferment is a constant product of the glandular secretion of the stomach, and it is met with at all periods of digestion except in cases of cancer of the stomach, in which it is never found. 2. The ferment was also found in the hypersecretion of the gastric juice of a fasting patient after his stomach had been washed out the previous evening. 3. Gastric juice, which contains hydrochloric acid, and which when neutralized causes coagulation of milk, does not appear to be affected in its action by the greater or less amount of acid contained in it at first. 4. The milk-curdling ferment does not pass into the urine. 5. The ferment is easily destroyed by an excess of alkali, and it is probably on this account that it does not pass into the feces under normal conditions. 6. During fever the ferment appears to be absent from the stomach. 7. The ferment causes coagulation more slowly in boiled than in fresh milk. 8. During the coagulation of milk by the ferment the reaction remains neutral, and lactic acid is not met with after coagulation.—*Lancet*, November 17, 1888.

Hygienic Treatment of Dyspepsia.—DUJARDIN-BEAUMETZ affirms that, in order to regulate the diet of dyspeptics, we must distinguish three conditions: 1. One in which there is an over-secretion of the gastric juice; 2. One in which the secretion is deficient; 3. One due to sympathetic disturbances.

1. *Dyspepsia due to over-secretion of gastric juice.*—Diet to be purely vegetable, consisting of eggs, farinaceous preparations and fruit. *a.* The eggs to be soft-boiled, especially the yolk. *b.* Farinaceous foods to be taken in the form of soft soups, as potato, turnip, lentil, Indian wheat, chestnut, oatmeal, barley, and macaroni soups; all these, of course, to be rendered as thin as

possible. *c.* Vegetables to be thoroughly cooked and to be taken in the form of vegetable soups, or soup made of small peas, all salads to be well boiled; the same holds good for spinach and turnips. *d.* All fruits, with the exception of raisins, to be made in the form of jelly. *e.* The bread to be well baked, or toasted. *f. Drinks.* Wine mixed with water, light beer, or milk mixed with alkaline waters.

2. *Dyspepsia due to deficient secretion of the gastric juice.*—Peptonized substances, toasted bread, bouillon, mixtures of broths and milk, powdered meats, scraped meats, peptones, pepsin, lemonade with hydrochloric acid:

℞.—Acid hydrochloric . . . . . ʒij.
Aquæ . . . . . 1 pint.
One glass after each meal.

3. *Dyspepsia due to sympathetic troubles.*—Diet to be purely vegetable.—*Revue de Thérapeutique*, November 1, 1888.

Action of Antipyrin on the Teeth. — DR. GALIPPE, a dentist, finds that antipyrin taken internally has the effect of blackening the teeth. Teeth which, previous to the administration of this drug, had lost their enamel, blackened sooner than otherwise healthy teeth. The discoloration is only temporary, as it can be removed by cleansing the teeth with water containing an abundance of oxygen. — *Deutsche medicinische Wochenschrift*, November, 1, 1888.

Tubercle of the Aorta.—PITTRICH relates (*Zeitsch. f. Heilk.*, abstr. Weichselbaum, *Centralbl. f. Bacteriology*, iv. 20) a case of acute miliary tuberculosis in a boy, twelve years of age, in which the source of general infection appeared to be the rare (hitherto undescribed) condition of tuberculosis of the aorta; for to the posterior wall of the ascending aorta adhered some tuberculous lymphatic glands, from which the tubercle had spread into the coats of the vessel. Bacilli were found both in the glands and in the aortic wall, and it is assumed that they were disseminated through the blood stream by direct detachment from the intima of the vessel.—*Lancet*, November 17, 1888.

Inoculation of Erysipelas in Cancer of the Breast.—DR. A HOLST (*Centralblatt für Bakt.* and *Journ. des Cour. Méd.*, 1888, 39) reports the following: "Several months after the extirpation of one of her breasts for cancer, a woman noticed upon her skin a new cancerous formation, the entire right side of her chest resembling a budding field. Her general condition being good, she was advised to submit to an erysipelatous inoculation, to which she consented willingly.

"The first inoculation proved unsuccessful, but thirty-six hours after the second one, the patient was seized with rigors; the characteristic eruption of erpsipelas gradually spread over her right arm, and by degrees the disease was well developed, the redness extending to the left side of her chest and back. The fever abated on the seventh day.

"Four months and a half after inoculation, everything had returned to the initial stages; the perceptible improvement of the first few months had disappeared, cancerous nodules reappeared on the inner surface of the arm, and the malady continued its onward course.

"To sum up, Holst concludes, in accord with Nelsen, that under the influence of erysipelas the progress of cancer is at first arrested, but later on its fatal termination is hurried."—*L'Union Médicale*, November, 1888.

Treatment of Ozæna with Naphthol.—At the last medical congress of the French Laryngological Society, DR. RUAULT stated that in treating ozæna he irrigated the nasal passages three or four times daily with the following mixture:

To one pint of water add a large spoonful of the following powder,

℞.—Borate of soda.
Bicarb. of soda, ãã equal parts.
And then a teaspoonful of the following:

℞.—Naphthol . . . . . 12 parts.
Alcohol (90°) . . . . . 84 "

In very obstinate cases after having performed irrigation with the above, insert into the passage, and allow to remain for fifteen minutes, a tampon saturated with the following:

℞.—Naphthol . . . . . 12 parts.
Tr. quillaiae . . . . . 88 "
Aquæ dest. . . . . 400 "

The advantages of this treatment are, first, a rapid disappearance of the bad odor; and second, marked diminution of the secretion. The only disadvantage in the use of naphthol is a slight burning sensation, perceived immediately after its application, which, however, soon disappears. It is *essential* that the irrigating mixture should be freshly prepared before each application.—*Deutsche med. Wochenschrift*, October 25, 1888.

Treatment of Hepatic Colic with Olive-oil.—DR. CHARLES N. VALIN, of Zeloeil, Que., reports that he has tried the "olive-oil" treatment for hepatic colic, as first advocated by Dr. Just Touatre, of New Orleans, with marked success. He had tried all the remedies recommended by the leading authorities, such as morphine, chloroform, ether, antipyrin, and various purgatives, without any decided benefit. In the present case he resolved, as a *dernier ressort*, to try olive-oil. His patient, a woman about forty, was getting rapidly worse. Her temperature was high and unvarying, with marked delirium; her digestive organs very irritable; tongue red, dry, and glazed. He was in doubt whether she would be able, while in such a condition, to take and retain such large doses of oil. Still he tried. Two large glasses of oil were administered, the second fifteen minutes apart from the first, and, to his surprise, both were retained. Two hours later, she passed a number of calculi, some large, some small; some hard, others soft. From this on the temperature subsided, the tongue became moist, food was retained, and his patient made a rapid recovery.—*L'Union Médicale du Canada*, November, 1888.

Treatment of Pneumonia.—MARAGLIANO, of Genoa, at the first Congress of the Italian Society for Internal Medicine, recently held in Rome, states that he regarded the cardiac weakness in pneumonia as due to poisoning of the blood from the infecting microbes of this disease, and holds that venesection is indicated in pneumo-

nia under the same conditions that it would be indicated in uræmia. In his experience the internal administration of iodide of potassium and calomel, as well as parenchymatous injections, has proven to be of no avail. Cold baths he has found to do good. Of antipyretics he holds quinine to be the best. Alcohol is indispensable. Ipecac he finds injures the heart.

CARDARELLI thinks it would be difficult to assume from the mere spreading of the pneumonia infiltration whether venesection was indicated or not; it would likewise be difficult to state that venesection would rid the blood of its infectious elements. As for ipecac, it was certainly a heart poison, but its beneficial action upon the bronchia and lungs would certainly supplant its action upon the heart.—*Deutsche med. Wochenschrift*, November 1, 1888.

Action of Hydrofluoric Acid on the Tubercle Bacillus.—At a late meeting of the Academy of Medicine, DR. JACCOUD called attention to the fact that he had inoculated four guinea-pigs with the sputum of phthisical patients, and then six others with phthisical sputum which had been submitted to the action of hydrofluoric acid for forty-five minutes, with the following results:

Two of the first four died rapidly of septicæmia, the autopsy revealing no tuberculous lesion whatever. The two remaining presented a diffuse tuberculosis, the greater part of the granular deposit being found in the axilla, the neck, and the mediastinum; while in the lungs, the liver, and spleen the deposit was just in the state of formation.

The six guinea-pigs inoculated with the sputum which had been submitted to the vapor of hydrofluoric acid presented all, at the expiration of from five to eight weeks, a diffuse tuberculosis, identical with that of the first six guinea-pigs. The extent of the tuberculous deposit was even greater, reaching the mesenteric ganglion, and this too when the strength of the acid was at its maximum, being of equal parts of acid and water.

Hence he deduced the conclusion that hydrofluoric acid in solution does not modify in any way the virulence of the bacillus tuberculosis.

Similar experiments with pure hydrofluoric acid led Dr. Jaccoud to conclude that it would destroy the bacillus tuberculosis, but the establishing of this fact was of no practical value, since it would be impossible to introduce pure hydrofluoric acid into the human economy.

DR. HÉRARD, responding to Dr. Jaccoud, said that air charged with pure hydrofluoric acid could be inhaled for at least one hour at the rate of two pints a minute; the acid thus inhaled would contain from fifty to sixty per cent. of water, which could even be tolerated by children.

Dr. Hérard further spoke in commendation of the experiments of Dr. Trudeau, of New York, while he criticised severly those of Drs. Grancher and Chantard, these gentlemen having made use of intra-venous injections, while hydrofluoric acid should be simply inhaled. He also stated that a number of physicians have obtained great success from the acid inhalations; thus Drs. Moreau and Cochez treated sixty cases, in twenty-eight of which there was marked improvement; Dr. Goetz treated thirty cases with improvement in nineteen. He regretted that Dr. Jaccoud did not put his experiments to greater advantage. With pure acid, or with a solution of two-thirds or three-quarters pure acid, the remaining one-third or one-quarter being water, the results would differ largely. In his opinion Dr. Jaccoud had experimented with solutions too dilute to act with efficiency.—*L'abeille Médicale*, November 8, 1888, and *L'Union Médicale*, November 8, 1888.

Meco-narceine a New Hypnotic.—DR. LABORDE reports in the *Bull. de l'acad de Méd.*, 1889, No. 19, that in conjunction with Dr. Duquesnel he has obtained from opium a new alkaloid to which he has given the name of méconarceine. He claims for this preparation, that it produces a quiet sleep, only slight contraction of the pupils, slight anæsthesia, no headache, and no disturbance of the digestive tract.—*Centralbl. für klinische Medicin*, October, 1888.

To Prevent the Deposition of Fat in the Mammæ.—After speaking of the difficulty which women encounter in taking iodide of potassium to prevent the deposition of fat in their breasts, PROFESSOR KISCH gives the following treatment, which he praises highly:

At first the breasts must be covered with a salve of iodoform, the formula of which is as follows:

℞.—Deodorized iodoform . . 1 part.
Vaseline (pure) . . . 15 parts.
Essence of peppermint . . 11 drops.—M.

The breasts are then enveloped in warm linen cloths which have previously been dipped in the following solution:

℞.—Alum . . . . . 1 part.
Acetate of lead . . . 15 parts.
Distilled water . . . 100 " —M.

Over the towels place some waxed paper, the whole to be left in place for twelve hours. The inunctions and wrappings are repeated morning and evening. The treatment must be continued for several weeks. The breast should also be rubbed with an aromatic alcohol to harden the skin and prevent it from drying up. Finally, a bandage should be worn which will hold the breast well up.—*Gazette Gynécologie*, November 1, 1888.

Successful Treatment of Leprosy.—DR. DRECKMANN claims to have successfully treated a typical case of lepra tuberosa and anæsthetica by Unna's method, which consists in painting the entire body, hands and feet excepted, twice daily, with a ten to twenty-five per cent. salve of chrysarobin, while to the hands and feet is applied a five to twelve per cent. pyrogallic-acid salve. Internally, forty-five grains of ichthyol are taken daily, in divided doses.—*Wiener med. Presse*, Nov. 11, 1888.

Treatment of Whooping-cough.—DR. WIKSTRAND, of Stockholm, writes (*Wiener med. Blätter*, No. 17, 1888) that in Sweden alum is considered the best remedy for whooping-cough. It is administered in a two per cent. solution, of which a small teaspoonful is taken from four to six times daily. Under its influence the severity as well as the frequency of the cough abates, the vomiting ceases, and the appetite is reëstablished.—*Centralbl. für klinische Med.*, Nov. 17, 1888.

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SATURDAY, DECEMBER 8, 1888.

DEATH BY DECAPITATION AND BY ELECTRICITY.

THERE has recently been considerable discussion among the learned societies and by the press, in France, upon the subject of capital punishment by decapitation, as practised in that country. There are those who oppose the mode of execution by decapitation, because, as they suppose, feeling and consciousness survive, for a time, the severance of the head from the body; others, who regard the application of capital punishment as a great social crime, which has never prevented any other crime, and are opposed absolutely to the death penalty in any form whatsoever.

M. PAUL LOYE, who has made a careful study of the subject of death by decapitation, with the object of determining, by the aid of scientific experimentation, whether consciousness survives decapitation, has sought the present opportunity for publishing the results of his investigations. He has left out of the question everything that relates to sentimentality and the right society exercises of depriving a human being of life, and has devoted himself strictly to the scientific aspects of the question. He has not shrunk from being present at the execution of criminals, and of noting carefully the appearances after decapitation; and being instructed on this point, he has sought in the laboratory the explanation of the facts which he has observed, and has endeavored to determine their physiological value. The conclusion arrived at which most interests society is that, if the penalty of death is to remain in the penal code, decapitation is the mode of punishment which abolishes most completely the sufferings which result from the application of the penalty.

Investigations have shown that if, by means of anæsthesia, an animal is plunged into profound unconsciousness, the contractions of the face, the distortions which appear to indicate violence of suffering, produce themselves with their usual regularity and physiognomy. They are not then conscious phenomena, indicative of sensations received, but unconscious automatic acts.

While society has the right to demand that the criminal who has merited the penalty of death shall not be subjected to horrible torture, it is not ready to assume the position of the "elegant sentimentalists, sometimes maudlin and semi-poetic," who would abolish capital punishment absolutely. The mutilation of the body by the guillotine is repulsive, though unattended by suffering, and furnishes a specious argument to the opponents of capital punishment for pursuing their opposition. The suffering often caused by hanging through maladroitness of the executioner, suggests a change to a mode which would meet the requirements of the law without the possibility of inflicting torture. It is upon this ground that New York has recently prescribed the mode of execution by electricity in the place of hanging. No execution has yet taken place by this mode.

In THE NEWS of May 14th last, the subject of death by electricity was discussed, and reference was made to the recent studies of Arsonval upon this mode of death, which show that the action of electricity is direct and disruptive, causing instantaneous and immediate death, by disintegrating effects upon the nervous, vascular, and muscular tissues, which lose instantaneously their physiological properties. Fell, of the Niagara University, Buffalo, by a series of experiments on animals, has found that a sufficiently powerful electric current produced instantaneous death, and that resuscitation after the passage of such a current is impossible.

As it has been proved that both the mode by electricity and that by decapitation are unattended by suffering, it would seem to be a matter of indifference, from a humanitarian standpoint, whether the one or the other be the established form of capital

punishment, but the latter cannot be relieved of the picture of horror. Time will determine whether the country is prepared to follow the precedent established by the State of New York.

THE FLORIDA EPIDEMIC ABATES.

AT Jacksonville, November 27th was the first in 112 days in which a "clear bill" was declared by the Board of Health; that is, no new cases of yellow fever and no deaths from that cause were registered on that day. Twenty cases only then remained in the city, and these were all convalescent and past the danger-point. The total cases during the epidemic will approximate very closely to 5000; and the ratio of mortality, according to the latest official data, is not quite nine per cent. of the reported cases. The fair presumption is that the epidemic of 1888 is about to pass quietly into history, to be grouped with the numberless other pestilences that have destroyed human life.

But just what will be the condition of Florida when Jacksonville has wholly recovered? It becomes highly important, during the coming winter, to settle the sanitary questions which so deeply interest the southern tier of our States; they are questions which relate to the dangers, believed by many to be permanent at several points below the frost-line in Florida; and also to the remedies and the future prevention of a similar destruction of life and values. A grave responsibility rests with the Legislature of the afflicted State as to what steps are taken this winter toward the formation of a strong State Board of Health. No false economy should be allowed to come between the welfare of the State and country and the full and efficient policing of the Tampa Bay district.

We would strongly urge the medical press to join in pointing out the prime importance of establishing a vigorous and liberally equipped State Board of Health. The profession should unite in holding up the hands of our Southern brethren, who must otherwise struggle yearly with an entrenched enemy. Those who travel in Florida should also be cautioned that the lower part of its peninsula may be infected all the winter through. It is reported on good authority that there were cases of fever in Jacksonville as early as last February, the infection having been brought northward from Key West and Tampa in midwinter along the line of the railway from the latter town.

We rejoice with Jacksonville that the terrible visitation of 1888 is apparently drawing to a close, but we must not overlook the dangerous possibilities which must continue if this winter's preventive work be not done wisely and well. To imitate a form of expression used by Pasteur, in his recent address, the law of humanity places the duty, upon those in authority, to guard well the "frontiers of life."

THE resignations of Prof. D. Hayes Agnew from the Chair of Surgery and of Prof. William Osler from that of Clinical Medicine were presented to the Trustees of the University of Pennsylvania last Tuesday, to take effect at the end of the winter's course. They were accepted with expressions of regret and high appreciation of the value of the services which they had rendered to the University.

THE Commissioner of Agriculture has appointed a commission, consisting of Professor William H. Welch, of Johns Hopkins University; Dr. E. O. Shakespeare, of Philadelphia; and Professor T. J. Burrill, of the University of Illinois, to investigate the subject of swine diseases in the United States, and the methods of their treatment and prevention.

A PROTEST to the Council of the British Medical Association, signed by a large number of the most influential members of the profession in Great Britain, calls attention "to the publication in the 1450th number of the *Journal* of the Association of the facsimile of a 'script' by the late Emperor Frederick of Germany, referring to his treatment by one of his medical attendants. The publication of this document the signers regard as a violation of professional confidence, and its appearance in the *British Medical Journal* as discreditable to the medical profession of this country. They accordingly request the President and Council to take such immediate action as may be required to clear the Association and profession from the discredit now attaching to them in respect to this matter."

The *British Medical Journal* of November 24th (just received) "feels it necessary to say that the protest appears to us, editorially, to be based on incomplete information, and that an answer which we consider adequate will be laid before the Council." A press cablegram from London, on November 28th, however, states that at a Council meeting of the British Medical Association a resolution was passed deprecating the publication of the details of the late Emperor Frederick's illness as a violation of professional confidence; and that the Council

accepted the regrets of the Editor of the *Journal*, concerning the publication of them.

In this connection it may be further stated that Sir William Jenner has resigned from the British Medical Association on the grounds, it is alleged, that as Court Physician he could not countenance the publication, in the *British Medical Journal*, of the late Emperor Frederick's notes to Sir Morell Mackenzie; and Sir Morell Mackenzie has resigned his membership in the Royal College of Physicians for reasons which are not stated.

RECENT elections in England and Wales have placed medical men at the head of the municipal government in the towns of Hull, Bath, Marlborough, Wolverhampton, Liskeard, Morpeth, Godalming, Congleton, Calne, New Romney, and Yeovil.

AT the University of Vienna a considerable number of American students registered at the opening of this year's session of the medical school. The *Lancet*, November 17th, states that there were seventy English-speaking medical students, "most of them American," and that some of the courses are given in English. The *Vienna Weekly News*, the only paper published in English in that city, has a column devoted to the interests of the medical students.

SOCIETY PROCEEDINGS.

PHILADELPHIA COUNTY MEDICAL SOCIETY.

Stated Meeting, November 7, 1888.

THE PRESIDENT, J. SOLIS-COHEN, M.D., IN THE CHAIR.

DR. A. V. MEIGS read a paper on the

TREATMENT OF PERITONITIS.

(See page 641.)

DR. J. M. BALDY then read a paper on the same subject.

(See page 642.)

DR. J. H. MUSSER said that he had but little, if anything, to add to the able papers of Drs. Baldy and Meigs, unless it be his own personal experience. While interested, and in a measure agreeing with the remarks of Dr. Baldy, yet, as a medical man, he must largely agree with the conservative views of Dr. Meigs. In one respect, however, he begged leave to differ, and he believed that cases of idiopathic or so-called functional (?) peritonitis must be very rare, for in the course of a tolerably large experience he had not met with any; but, on the other hand, had had frequent cases that originated from some local cause. Indeed, it is his belief that in every instance almost, some disease, acute or chronic, in the intestinal tract, or diseases of the organs covered by the peritoneum, is the cause of inflammation of that membrane, apart from septic or microbic causes.

A successful treatment of all cases, therefore, must depend, in the first place, upon the recognition of the many antecedent pathological conditions that may be considered as causal. A large majority of the cases that he has seen got well without resorting to surgical measures. In these instances a similar plan of treatment to that suggested by Dr. Meigs was, to a certain extent, carried out, notwithstanding the fact that a local or a focal origin, if you please, of peritonitis could always be determined, and the general and local medical treatment will often either prevent, or at least counteract, the deleterious effects of a general inflammation, as before intimated.

The plan of treatment which he has carried out in most of the cases has been rather simple, beginning in the first place with local depletory measures either by blisters or by local depletion with leeches, not fearing the depressing effects of local depletion, but rather encouraging further bleeding than otherwise, following the depletion by poultices, and possibly by general stimulating applications, such as turpentine. At the same time he endeavors to open the bowels as early as possible, and while, on the one hand, vegetable cathartics are of service, yet, on account generally of the excessive vomiting, some mercurial has usually been preferred. He uses principally, if vomiting is present or not, calomel in doses of one-twelfth, one-eighth, or one-fourth of a grain every hour or half hour, until the desired effect is produced; and, in addition to the purgative effect, he is, indeed, not disturbed if he can get a constitutional effect of the drug also, for, as is well known, its antiphlogistic effects in peritonitis are undoubted.

With regard to opium, he uses it simply to relieve pain, and, hence, in the smallest doses possible. He prefers the hypodermatic injection of morphia, and it is surprising frequently what small doses are sufficient to give comfort. Sometimes an eighth or a sixteenth of a grain, twice daily, will suffice. In addition to the anodyne effects of the drug, its stimulating effect is, of course, of service, and after the mercurial has acted on the bowels, he combines the extract of opium with the drug, giving the opium more frequently, and the mercury less. Usually he uses atropia with the morphia, and in this way counteracts the depressing effects of the opiate.

Stimulants are worthy of mention. He begins their use early, and, indeed, from the first twenty-four hours in some cases permits it as the only kind of food administered until all danger is past. He gives it early, in order to avert or to mitigate the stage of collapse which is likely to ensue. With this general plan of treatment, bleeding, moderate purgation, opium to relieve pain, and the use of stimulants, his patients have usually recovered. He may very often endeavor to give in some way quinine, preferably by suppositories.

Patients die of peritonitis generally, not because its management is not understood, but because it is not recognized sufficiently early. Hasty examinations without due regard to the local origin of the symptoms of the disease—and of these pain is usually the earliest—cause one frequently to overlook the actual condition of the case. Two cases he has seen lately, one in consultation, another at the autopsy, illustrate this. They were both cases of peri-cæcal abscess. In the one instance the

patient was ill for four or five days prior to my visit. Prior to the last twenty-four hours he visited the physician's office, simply complaining of recurring attacks of sharp abdominal pain, which were attended with a moderate amount of diarrhœa. The physician looked upon it as a case of cholera morbus, and treated it accordingly. The day of his death the patient did not leave his bed, but was visited by the physician, who was horrified to find him in collapse. Unable to recognize the cause of collapse, not even suspecting that death was imminent, he asked me to see the patient. The thready pulse, the persistent watery vomiting or regurgitation of fluid, the cold sweat and the cold extremities, the tympany, and the rigid abdominal muscles, told the tale more plainly than his words, and an area of dulness in the right iliac fossa, with faint local swelling and tenderness, pointed to the appendix as the probable source of the inflammation. Death ensued a short time afterward, and at the autopsy a most extensive peritonitis, secondary to rupture of the vermiform appendix and peri-cæcal abscess, was found.

In the other instance the patient, a lad sixteen years old, was seen by the physician at six in the evening. In the hurry of his work he neglected the minute examination which he usually bestows upon them, and prescribed for what he thought was a colic induced by indigestion, which colicky pains had been going on for two or three days, the patient, however, being out most of the time. He saw him later in the evening, much improved, apparently, from the effects of opium, so often misleading because it masks symptoms, and was shocked to hear the next morning that at six o'clock his patient had died in collapse. In this case foreign bodies in the appendix had caused the usual rupture, with peritonitis and death. So, too, peritonitis arises, as we know, after inflammation of the tubes or ovaries, after disease of the biliary passages, and after other instances of local disease.

The most difficult question for the physician to decide, and the one that has always been the most serious in his mind, next to the grave question of when to open the bowels, is when to ask the surgeon's help. Given a case with a palpable tumor, with local œdema, the fever, the vomiting, and the general tenderness indicating a general inflammation, and the question is an easy one to decide. On the other hand, the tumor being obscure, possibly only an area of dulness outlines it, the symptoms, however, becoming threatening: shall we then ask for help? He always does, of course, when in doubt; but he is fixed in his mind to have surgical aid and instructs the family to that effect when persistent vomiting continues, when the night-sweats become marked, and when tympany and bowel obstruction are decided. Indeed, after the second night-sweat, even if there is no general peritonitis, but physical signs or clinical phenomena of local disease, he is much disturbed. Then, too, the increased frequency of pulse, or perhaps the signs of approaching collapse, which thus far, in his cases he has not waited for, would induce him at once to ask for a surgeon.

A word in regard to salines, of which he has mentioned nothing before. He has never been impressed with their value in peritonitis, although he has seen some of his colleagues administer them. In but one instance were they of any service, and this was after an abdominal section. But in all probability persons with a larger experience than he has had may see benefit. He did not wish to mislead any to think all his cases got well by medical treatment. Drs. Keen, Price, and Kelly could testify that he has sought the benefit of their skill several times.

A word in regard to a variety of peritonitis which he has neglected to mention, and that is, the so-called cases of recurring peritonitis. In a large majority of instances they are secondary to tubal disease or disease of the appendix; and if a second attack occurs he advises at once operative interference, either before the attack has terminated or after the attack has subsided.

In corroboration of his remarks as to the value of the medical treatment of peritonitis, he quoted the experience of Dr. Girvin, which has been large, and who is a most careful, astute physician. He told him recently that he had never lost a case of peritonitis, and that his plan of treatment is the use of some remedies to open the bowels, along with the use of remedies to allay the pain. To open the bowels he usually gives a pill containing a quarter or a half a grain of calomel, half a grain of extract of rhubarb, half a grain of aloes, with one-eighth or quarter of a grain of the extract of opium. Giving the pill early, he very soon secures a purgative effect, and when that is induced feels much more comfortable in regard to the welfare of his patient. He uses morphia by subcutaneous injection, and only in sufficient doses to keep the patient comfortable throughout the illness.

(Dr. Musser was compelled to leave the room before the discussion closed, but has learned that Dr. Baldy asked why he should endeavor to open the bowels early in a case of peritonitis. In reply he begs to add this, which is the only explanation which has satisfied himself, and which he gives, of course, with reserve, as he does not believe it has been previously mentioned. Take, for instance, a case of appendicitis with rupture. We know that the inflammation is always due to obstruction in the canal. If such obstruction breeds deleterious effects in this canal, a similar obstruction would produce the same bad effects in the larger canal, the intestine; and, in addition to an inflammation of the serous coat, a retention inflammation is set up, and an enteritis complicates the case. Moreover, great danger in peritonitis arises from the tympany, no doubt, and to prevent it the lumen of the canal must be opened early, for if not, the bowel paresis which ensues in peritonitis, and which contributes to the tympany, will prevent clearing the canal.)

DR. JOHN B. ROBERTS said that on general principles he objects to opium after operative procedures. The question to-night seemed to be dogmatically settled by gentlemen of large experience. He was brought up on the opium treatment and has employed it. He believes now that it was a mistake in many cases.

DR. M. PRICE did not believe that peritonitis is ever idiopathic. Call it by what name we please, it resolves itself into some irritation or lesion. Carbolic acid, almost pure, and phenol sodique, in its full strength, he has known to be poured undiluted into an abdomen after an operation. There will always be peritonitis after operations until so-called antiseptic surgery of the peritoneum is abolished. Mr. Tait is correct in saying that the opium treatment has its place only when you have given

up all hope of curing the patient and want to make him comfortable. We make him perpetually comfortable. We not only put the bowels in splints but the whole body in a fracture-box. Prof. George B. Wood, thirty years ago, advocated after bleeding, calomel and purging with Epsom salts and senna, and perhaps somebody suggested it before him. But in recent times the credit of the saline treatment belongs to Mr. Tait. Something was said of five days' treatment. The case should be in the surgeon's hands before that. There is already pus.

The tympany is of several kinds. The distention is often the cause of death. He has opened the belly and found a diverticulum adherent to the omentum, with the intestine through it; the intestine was returned without difficulty; the distention was the cause of death. Many cases of recovery are of such character. If we knew it, purging would be out of place. In operations when there are sharp pain and indications of inflammation, then we do not wait. We open the belly and supply moisture. We pour in hot water—gallons of it—and give turpentine enemata and Epsom salts.

The bowels are already in splints. He has given six ounces of Epsom salts where ordinarily half an ounce would answer. As soon as free movement occurs the patient recovers.

DR. C. B. NANCREDE said that he was the first surgeon in this city to open the belly for shot-wound, and as he never hesitated to operate on abdominal cases when necessary, he cannot be accused of timidity. But is it not time to draw the line when we are told that all cases of peritonitis which do not at once improve should be treated with the knife? He is a living specimen of recovery without section after an appendicitis.

No one has here advocated the use of a drug valuable in the sudden collapse incident to the onset or in the later stages of some cases of peritonitis, when opium means death. That drug is atropine, hypodermatically, in large doses. If it is true that the vast majority of, if not all, cases of peritonitis are secondary—or, in other words, infectious—there are many experiments besides those quoted to-night, shedding a flood of light upon the subject, which show that the peritoneum can take care not only of fluids or foreign bodies, but even of pathogenic organisms and feces, provided that the quantity introduced during a given time does not exceed a certain limit. If all the material can be absorbed in an hour or two, the animal is safe. If that limit is exceeded, we have general suppurative peritonitis. Here the eliminative treatment finds its explanation in preventing a general peritonitis, as the peritoneum is only an enormous lymph sac.

If opium is only to be given to relieve pain, this is not what was formerly understood by the opium treatment. It will not splint the bowel in mere anodyne doses, which was Alonzo Clark's original idea, and that of all his followers since.

He disagreed with the medical gentlemen who would send for the surgeon to lock the stable-door after the horse had escaped; in other words, wait, as is too often the case, until an operation is what is termed a "last resort," which amounts really to there being no reasonable chance for a success which an earlier resort to the knife would have very probably insured. The surgeon should be permitted to see the case *early*, and share in the decision as to when the operation should be done, when it should be postponed, and when declined; it is only by the chance afforded by a study of the *medical course* pursued by the case that the surgeon can operate intelligently and successfully.

He is using less opium as he grows older in all surgical work. He has tried the saline treatment of peritonitis in several cases after section, and he has had no cause to regret it.

DR. JOSEPH PRICE had learned something new, to-night—that abdominal distention impedes the locomotion of germs. He was glad to be enlightened on this point, it will be of very great value to the class of operators that fear them so much. Experienced operators in abdominal surgery fully recognize the deleterious effects, and the great danger of distention. The mere presence of an excess of fluid or gas in the intestine is, in itself, an efficient cause of obstruction. He was not prepared to accept such counsel. He would much rather incise the bowel, and thus favor the evacuation of gas and drainage of intestinal contents. Dr. Meigs counselled delay. On the contrary, the earlier and simpler the operation the greater is the chance of recovery. He could not, therefore, conceive any advice more unfortunate, more unjustifiable for patients dying of peritonitis. In fact, the whole tendency of modern surgery is to anticipate exhaustion, shock, and collapse. The paper of Dr. Baldy referred to peritonitis, and not to pain and tenderness, and his remarks were devoted to peritonitis due to a recognized lesion, and not to pain and tenderness.

The treatment of peritonitis resulting from external or infectious origin would be entirely irrational were drainage discarded. Once decide that the best method of clearing up a peritonitis is by operation, then drainage must follow that operation as naturally as sutures are used to close an incision.

If a peritonitis is septic in its origin, such as is seen frequently after criminal abortion, carlessness after miscarriage, and after gonorrhœal tubal disease, drainage is the third statement of the argument of operation:

1. Operation is required.
2. Douching and flooding the abdomen are necessary.
3. Drainage is the bulwark of the whole procedure.

That cases of infectious peritonitis recover without drainage, is no more an argument against it than that some patients recover from smallpox, never having been vaccinated. If he used all the antisepsis possible before and during an operation, and at its close overlooked the fact that he was leaving a possible infection behind, his antisepsis was only a parade, and misleading. If Listerism is the foundation of modern surgery, drainage is the keystone of its application in such cases of abdominal surgery.

DR. LONGAKER said that from the remarks of the previous speakers it appeared that the opinion held of the value of opium in peritonitis depends upon the question, Is it ever an idiopathic disease? His own views are that it is not, he had never seen a case in which it was. In general he agreed with Dr. Baldy.

In the *Transactions of the Pennsylvania State Medical Society* for 1888, vol. xix. p. 103, there is reported a case in which abdominal section was done for puerperal peritonitis. It was one of the first cases operated on in this city. In June, of the present year, he operated on a second case, whose history is very interesting. Female, aged twenty-six years, married fourteen months, About two years

before, she "caught cold" during her menses. Her periods became painful, and a physician was consulted. Weekly intrauterine applications were made, but as there was no improvement, and as the treatment was extremely painful for hours, other advice was sought. Two months before his visit she fell into the hands of the gentleman with whom he saw her. He found the uterus fixed by a mass in Douglas's cul-de-sac; sound entered two inches, At her next period the doctor was called up in the middle of the night because of great suffering. She passed from bad to worse, and on the day preceding his visit developed unmistakable signs of general peritonitis. She failed to get any relief in spite of grs. ij ext. of opium by suppository. Magnesium sulphate, ℥j dissolved in hot water, was ordered to be given every hour. It relieved the obstinate constipation, and gave her far more relief than the opium. Twenty-four hours later abdominal section was made. Pus was found in the abdominal cavity. Irrigation and drainage were used. All her symptoms improved, but on the fourth day she began to fail, and died on the fifth. Autopsy revealed obstruction of the bowels. It also showed a ruptured pelvic abscess situated in the appendages of the left side. The peritoneal cavity contained no fluid, and the operation had arrested the course of the disease. A knuckle of ileum had become adherent to the pelvic viscera, causing obstruction and death. The case is a warning to those who are in the habit of treating the endometrium promiscuously.

DR. J. TYSON confessed that when he heard Dr. Meigs portray his typical case of peritonitis he felt that the treatment he advocated would be the one he should always prefer to follow. Yet he did not think the parallel he drew between the state of the peritoneum in peritonitis and that of a "sore" is altogether justified. The inflamed peritoneum is rather to be compared to the earlier stages of inflammation in which we resort to leeching and depletion, and he had, by what has been said since, been strongly impressed by the rational character of the saline aperient treatment. It has the further advantage in quickly cutting short those doubtful cases in which a fecal accumulation is producing pain, the first symptom of inflammation, which disappears at once with its cause —the fecal mass.

He desired to call attention to a fact not mentioned, that rheumatism of the abdominal muscles sometimes simulates peritonitis so closely as totally to mislead. He has himself had this experience, and seen the symptoms yield with magical promptness to salicylate of sodium.

DR. MEIGS could not see why any one should doubt the possibility of the occurrence of idiopathic peritonitis any more than idiopathic pleurisy. There is no reason, in the nature of things, why it should not occur, and that some physicians have not met with it is no proof that others who say they have are mistaken. Pleurisy, by extension of the inflammation, may be the cause of pericarditis, and in cases of diaphragmatic pleurisy peritonitis to some extent is a common secondary result. If there be diarrhœa, with inflammation of the mucous coat of the bowel, why should it not give rise to peritonitis? It seemed to him that in the discussion the difference between peritonitis, as seen by those who are not surgeons and the disease as a sequel of operations, has not been sufficiently kept in mind.

DR. BALDY said that Dr. Meigs and Dr. Musser believe in the opium treatment, and yet after giving opium for a few days they give purgatives. He should like to ask them what object they have in view when they give the purgatives, and what they expect to accomplish with them? Theoretically it is perfectly possible to have idiopathic peritonitis. Practically, however, he had never seen it. Some of the gentlemen in discussing this subject seem to draw a line between the cases of peritonitis seen by the physician and those seen by the surgeon. Peritonitis is peritonitis the world over. It makes no difference whether it is set up by the surgeon himself or comes on idiopathically (so called): the result is always the same—inflammation of the peritoneum; the cause cannot alter the principles of treatment. His paper discussed peritonitis and not simply pain and distention; as for an inflammation throwing out a bland fluid, he did not believe it. The products of inflammation are always irritating. Opium has been advocated in small doses and to relieve pain. In his experience small doses will not relieve pain. The dose must be comparatively enormous. Purgatives will relieve the pain as quickly as opium, and when once relieved it remains relieved, which it does not do with opium. If he were aiming at the relief of pain solely, he should most decidedly turn to his salines.

The objection has been made that salines give watery stools and do not carry away much feces. Of course, it is desirable that the fecal matter should come away, and so it does in great part. But large, watery stools are exactly what we desire to obtain. The whole principle of this treatment lies in its depleting powers. For this purpose the salines are given in large and *concentrated* solutions: they are peculiarly adapted to the early and highly inflammatory stages of inflammation. If purgatives are going to relieve, they will do so quickly, and we have no need of waiting for four or five days to know what to do next. Often, unless we use the knife, our patient is dead in five days. Recurring peritonitis always demands surgical interference.

Together with Dr. M. Price, he had but one use for opium in this disease—if everything else has failed, it is a good thing to give *ad libitum*, to ease the last hours of the patient.

NEW YORK NEUROLOGICAL SOCIETY.

Stated Meeting, November 6, 1888.

THE PRESIDENT, GEORGE W. JACOBY, M.D., IN THE CHAIR.

DR. W. H. THOMSEN read a paper entitled

PARENCHYMATOUS NEURITIS,

including the histories of a number of cases.

Case I. was that of a man of fifty-six years, formerly engaged in the lumber business and obliged to stand in water containing floating ice for hours at a time. This patient's symptoms had first pointed to central spinal trouble, but later had been those of a multiple neuritis. They had, however, been gradual in their onset, and there had been no evidences of pressure. There had been no shooting nor lancinating pains. The actual cautery had been applied over the spine and the hot glass rod over the sensitive nerve trunks. Nitro-glycerine had given the greatest relief from pain in this case.

Case II. was that of a man of thirty-five years, convalescing from diphtheria, There was no pain, but the laryngeal and pharyngeal paralysis was so profound that the general health suffered.

Case III. was that of a boy convalescing from typhoid fever. There were pains in the legs and feet with dropping of the feet.

Case IV. was that of a woman confined to her bed for three months in the course of phthisis. There were pains in this case in the feet extending to the knees, and in the hands with dropping of the ankles and the wrists, which progressed steadily till death, when extensive nerve degeneration was found without any evidences of inflammatory action. The case was presented as a typical example of a widespread inflammatory degeneration of the nerves. It was a parenchymatous neuritis analogous to that which could be produced by a ligature. The origin and history differed from those of an inflammatory neuritis, however much it might resemble this condition in its ultimate results. In the cases of typhoid fever and phthisis the degeneration may have been due to a mechanical cause—pressure from the loss of the surrounding fat. The fact that the vagus was implicated in the latter disease did not disprove the theory, as no statement had been advanced in regard to the condition of the bronchial glands.

The theory of a non-inflammatory parenchymatous nerve degeneration was important, as the treatment of such cases would differ from that of cases of inflammatory origin. In the latter antiphlogistic and soothing treatment was indicated, while in the former stimulating applications were required. It was questionable whether the term neuritis could be correctly applied to this type of the disease.

DR. L. C. GRAY had not heard the commencement of the paper, and did not understand why Dr. Thomsen objected to the term neuritis. He thought that the symptoms could be scarcely classed under any other name. There had been, as he understood, downright pain in the course of the nerves and eventually paralysis and atrophy. These were the clinical symptoms of neuritis and measured the severity of the neurotic lesion. The treatment of neuritis was, he believed, excepting traumatic neuritis, still *sub judice*. Since attention has been called to the disease, all had probably met with cases in which no local measures seemed to do any good. Quinine, the salicylates, and iron had been most beneficial in his own cases. Change of air was to be recommended. Even in the paralytic stage it was his custom to move the patient to another part of the city or even from a lower floor to a higher floor in the house. Change of location was especially indicated in the cases arising in our somewhat malarial suburbs.

DR. M. A. STARR applied powdered menthol diluted with starch under a flannel bandage for the relief of the pains of neuritis.

DR. JACOBY did not find the diagnosis of neuritis so easy as Dr. Thomsen had represented it, especially in typhoid fever. Myositis was a more probable lesion in typhoid fever. Zenker had even stated that neuritis was never found in this disease. As to the distinction made between the inflammatory and degenerative processes, both might be found in the same case. Which process was primary, and which secondary was still a question.

DR. THOMSEN had intended to call attention to only a single point, and necessarily had neglected many others touched upon by the gentlemen in the discussion. He had intended to call attention simply to the impropriety of the term neuritis, as applied to the process in the cases which he had described. There was no reason to suppose that the process in the case of phthisis had been inflammatory. The inflammatory process had certain definite characteristics, there were vasomotor disturbance, infiltration with serum and leucocytes, or living matter. In the neuritis of alcoholism, both in private and in hospital practice, he had observed circulatory and nutritive changes; there had been the same tendency as in the inflammatory process in other parts of the body. There was evidently inflammation of the sheath of Schwann and constriction of the nerve. These conditions contrasted with those in the cases which he had described. In the treatment of true neuritis he had used an application of equal parts of the oil of peppermint and olive oil, a preparation similar in action to that which Dr. Starr had recommended.

DR. GRAY inquired whether Dr. Thomsen recognized no inflammatory process within the sheath of Schwann.

DR. THOMSEN replied that he knew of no changes within the sheath of Schwann which could be called inflammatory.

NEWS ITEMS.

Disinfection of Clothing.—The Lord Mayor of Dublin made his formal inspection on Saturday last of the newly organized establishment for the disinfection of clothing, which has been opened by the Public Health Committee. The system is worthy of notice, not only as a guide to other sanitary authorities in organizing similar establishments, but for the purpose of satisfying the public that they may with confidence avail themselves of the facilities thus afforded to purify articles of clothing which may have been in contact with infection.

Much that has been done in the name of disinfection heretofore has been worse than useless. A common system in workhouses and other places where the matter is not understood, has been to fetch the bedding and clothing from infected houses in a van, that which is only suspected of infection being mixed with that which is reeking with miasm. The mass is then placed in what, for euphony, is called a disinfecting chamber; a pauper nurse or other unreliable official is supposed to raise the temperature to at least 240 degrees, which, unless he is watched, he may not do. The clothing is afterward removed and replaced in the cart which conveyed it to the place, and distributed to the owners, bringing back with it, possibly, not only its own original infection, but a share of that which the other clothes contained.

The arrangement which has been established in Dublin, under Sir Charles Cameron's advice, has none of the vices of this method. The clothes are collected by a van kept specially for the purpose, brought by the front gate to the receiving-room, and, having been ticketed, introduced into the disinfecting chamber (one of Dr. Scort's invention), where, under proper inspection, they are heated and kept up to the needful temperature for a specified time. They are then taken out by the opposite door into the laundry, where they are made up in the usual way, at the usual laundry charges, and sent off in a separate van by the back gate, never

having come into contact with infection from first to last. The process is carried out without charge, except for the laundry work, which is not essential to the disinfection, but is provided in order to induce the public to use the establishment without sending the infected clothing to ordinary laundries.

The entire establishment costs the citizens about £500 a year, which, if a total loss, would be money well expended, but it is expected that the receipts from hospitals and the public will recoup to the taxpayer a considerable part, if not the whole of this expenditure. The effective disinfection of clothing is one of the most important items in the improvement of the public health of any town, and it may be taken for granted that a penny expended in this way will probably save many shillings, so that the outlay of the Public Health Committee in this direction will be found to be true economy, and will redound to their credit and to that of Sir Charles Cameron, their very efficient officer.—*Medical Press*, November 7, 1888.

The Employer Responsible for the Medical Fees of his Servant.—According to the *Bulletin Médical*, the Justice of the Peace at Châlons-sur-Marne has rendered a decision by which he compelled an employer to pay the physician whom he had called in to attend his servant; the judge in this case naming the amount of the fee himself. From this the *Bulletin* draws the conclusion that an employer calling upon a physician to treat his employé, the former is responsible for the fee of the latter; especially would this be the case when the employé who is being treated is unknown to the physician, and who while being treated is discharged by his employer, the latter failing to notify the physician to stop treatment; but in this case the employer will not have to pay any more than the person benefited by the treatment could have afforded to pay.—*L'Union Médicale*, November 6, 1888.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT, U. S. ARMY, FROM NOVEMBER 27 TO DECEMBER 3, 1888.

By direction of the Secretary of War, leave of absence for two months is granted HENRY M. CRONKHITE, *Major and Surgeon*, to take effect upon his being relieved from court-martial duty at Little Rock Barracks, Arkansas.—Par. 7, *S. O. 276, A. G. O., Washington*, November 26, 1888.

By direction of the Secretary of War, the leave of absence granted EDWARD B. MOSELEY, *Captain and Assistant Surgeon*, in Special Orders No. 67, November 12, 1888, Division of the Pacific, is extended three months.—Par. 13, *S. O. 275, A. G. O.*, November 24, 1888.

CARTER, WILLIAM F., *Captain and Assistant Surgeon* (U. S. Army).—Is granted leave of absence for one month.—Par. 4, *S. O. 116, Headquarters Department of Texas, San Antonio*, November 12, 1888.

CLENDENIN, PAUL, *First Lieutenant and Assistant Surgeon* (U. S. Army).—Is granted leave of absence for fifteen days, to take effect December 4, 1888.—Par. 3, *S. O. 116, Headquarters Department of Texas, San Antonio*, November 12, 1888.

BENHAM, ROBERT B., *Captain and Assistant Surgeon* (U. S. Army, Fort Laramie, Wyoming).—Is hereby granted leave of absence for one month.—Par. 1, *S. O. 111, Headquarters Department of the Platte*, November 24, 1888.

By direction of the Secretary of War, the leave of absence granted ROBERT R. BALL, *First Lieutenant and Assistant Surgeon*, in Special Orders No. 129, October 18, 1888, Department of the Missouri, is extended one month.—Par. 11, *S. O. 279, A. G. O., Washington*, November 30, 1888.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF THE MEDICAL CORPS OF THE U. S. NAVY, FOR THE WEEK ENDING DECEMBER 1, 1888.

GAINES, J. H., *Surgeon*.—Detached from the "Dolphin," and ordered home.

ANDERSON, FRANK, *Passed Assistant Surgeon*.—Detached from the "Pensacola," and ordered to the "Dolphin."

JONES, WILLIAM H., *Surgeon*.—Detached from the "Richmond," and ordered to the "Pensacola."

RUSSELL, A. C. H., *Passed Assistant Surgeon*.—Detached from the Naval Academy, and ordered to the "Wabash."

DRAKE, N. H., *Passed Assistant Surgeon*.—Detached from the "St. Mary's," and ordered to the Coast Survey.

WHITAKER, H. W., *Passed Assistant Surgeon*.—Ordered to the Nautical School-ship "St. Mary's."

LEWIS, D. O., *Passed Assistant Surgeon*.—Detached from the Coast Survey, and ordered to the Naval Academy.

WENTWORTH, A. R., *Assistant Surgeon*.—Ordered for examination preliminary to promotion.

OFFICIAL LIST OF CHANGES OF STATIONS AND DUTIES OF MEDICAL OFFICERS OF THE U. S. MARINE-HOSPITAL SERVICE, FOR THE FIVE WEEKS ENDING NOVEMBER 24, 1888.

WYMAN, WALTER, *Surgeon*.—Detached from New York, N. Y., and ordered to Washington, D. C., November 16, 1888.

LONG, W. H., *Surgeon*.—Detached from Detroit, Mich., and ordered to Cincinnati, Ohio, November 16, 1888.

FESSENDEN, C. S. D., Detached from Norfolk, Va., and ordered to Louisville, Ky., November 16, 1888.

PURVIANCE, GEORGE, *Surgeon*.—Detached from Cincinnati, Ohio, and ordered to Baltimore, Md., November 16, 1888.

AUSTIN, H. W., *Surgeon*.—Detached from Chicago, Ill., and ordered to Milwaukee, Wis., November 17, 1888.

GODFREY, JOHN, *Surgeon*.—Detached from Louisville, Ky., and ordered to Milwaukee, Wis., November 14, 1888.

GODFREY, JOHN, *Surgeon*.—Detached from Louisville, Ky., and ordered to New York, N. Y., November 16, 1888.

MEAD, F. W. *Passed Assistant Surgeon*.—Detached from Baltimore, Md., and ordered to Norfolk, Va., November 16, 1888.

GUITERAS, JOHN, *Passed Assistant Surgeon*.—Detached from Camp Perry, Fla., and ordered to Charleston, S. C., November 15, 1888.

DEVAN, S. C., *Passed Assistant Surgeon*.—Detached from Savannah, Ga., and ordered to Washington, D. C., November 15, 1888.

URQUHART, F. M., *Passed Assistant Surgeon*.—Detached from Live Oak, Fla., and ordered to Dupont, Ga., November 3, 1888.

BROOKS, S. D., *Passed Assistant Surgeon*.—Detached from Wilmington, N. C., and ordered to Savannah, Ga., November 15, 1888.

STONER, J. B., *Assistant Surgeon*.—Detached from Charleston, S. C., and ordered to Wilmington, N. C., November 15, 1888.

BAILHACHE, P. H., *Surgeon*.—Granted leave of abence for twenty days, November 24. 1888.

LONG, W. H., *Surgeon*.—Granted leave of absence for sixteen days, November 21. 1888.

MCINTOSH, W. P., *Assistant Surgeon*.—Granted leave of absence for thirty days, October 24, 1888.

MAGRUDER, G. M., *Assistant Surgeon*.—Granted leave of absence for thirty days, November 23, 1888.

COBB, J. O., *Assistant Surgeon*.—Granted leave of absence for twenty days, November 20, 1888.

GEDDINGS, H. D., *Assistant Surgeon*.—Granted leave of absence for thirty days, November 1, 1888.

WYMAN, WALTER, *Surgeon*.—Detailed as a representative at the meeting of the American Public Health Association.

AUSTIN, H. W., *Surgeon*.—Detailed as a representative at the meeting of the American Public Health Association.

GODFREY, JOHN, *Surgeon*.—Detailed as a representative at the meeting of the American Public Health Association.

PROMOTIONS.

MCINTOSH, W. P., *Passed Assistant Surgeon*.—Promoted, and appointed Passed Assistant Surgeon, November 21, 1888.